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THE PAINTERS' EDUCATOR

BY T. C. TURNEY.

A PRACTICAL TREATISE ON PAINTING, STAINING, GRAINING, VARNISHING, CARRIAGE PAINTING, HINTS ON COLORING, GOLD LEAF AND GILDING.

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FULL INSTRUCTIONS AND MANY VALUABLE RECIPES.

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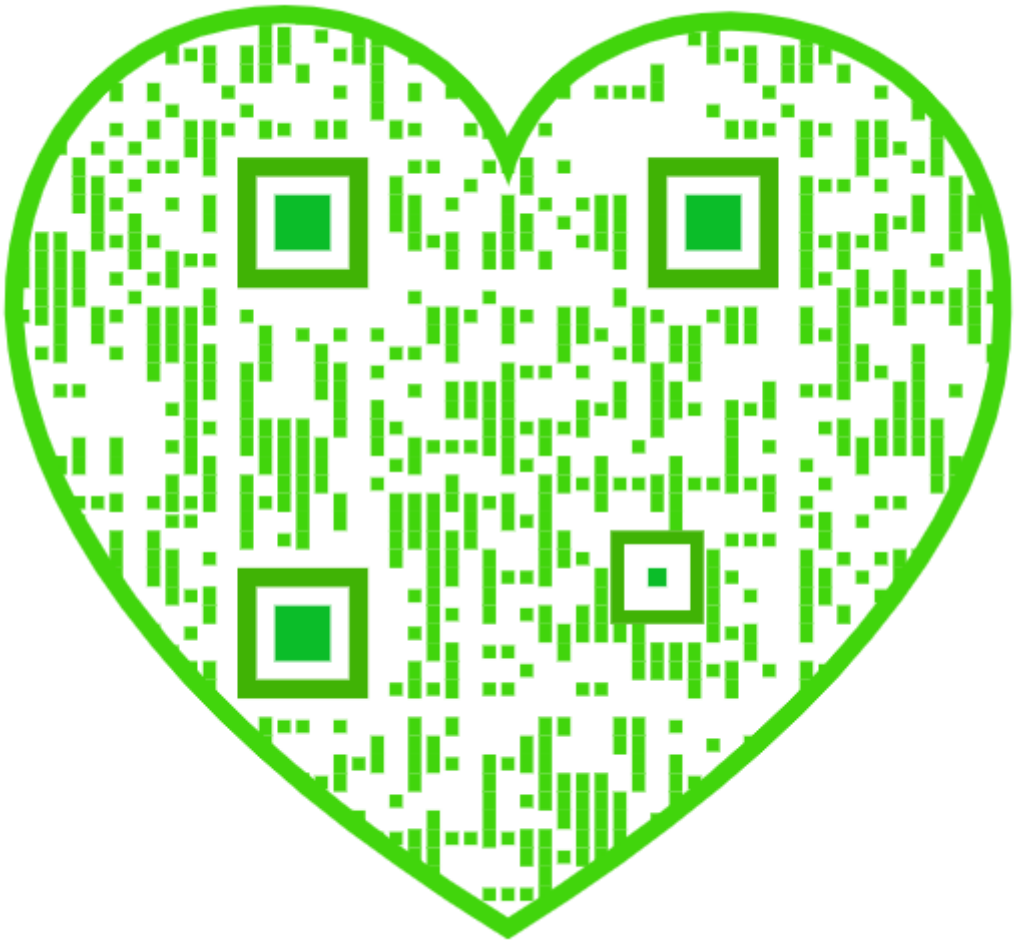

Yours truly
T. C. Turney.

THE PAINTERS' EDUCATOR.

FOR STAINERS, VARNISHERS, GRAINERS, CARRIAGE PAINTERS, FRESCO ARTISTS, GILDERS AND AMATEURS;

CONTAINING

RULES AND METHODS

IN

EVERYTHING RELATING TO THE ARTS OF PAINTING, WOOD STAINING, NATURAL WOOD FINISH, PAINTING PLASTERED WALLS, GRAINING IN OIL, CARRIAGE PAINTING, HINTS ON COLORING, GOLD LEAF AND GILDING, BRONZING AND BURNISHING.

BY T. C. TURNEY.

FULL INSTRUCTIONS AND MANY VALUABLE RECIPES. ILLUSTRATED.

1901.

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SEEST THOU A MAN DILIGENT IN HIS BUSINESS?
HE SHALL STAND BEFORE KINGS.—Prov. 22; 27.

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Introduction.

This work, "The Painters' Educator," will recommend itself to all who desire, in a cheap form, full information as to methods of doing painting. It contains all that is practical and valuable in mixing and applying paint, besides giving valuable recipes and formulas for making many colors, important to all.

For lack of that information which this book contains, many painters have lost many dollars. It prepares the painter to do better work, more different kinds of work, thus enlarging the field for making more money.

Such a guide is a necessity to the amateur, and valuable to many more advanced, preparing them, by the adoption of correct and safe methods of painting, for thoroughness and success. It is simple and comprehensive, adapted to the wants of every one, whatever his occupation may be. Its principles can easily be understood, and readily applied in practice

It ought to be in the hands of every one contemplating painting. It will give you a knowledge of the manner in which your work should be properly done; and puts you in a position to know whether you have a painter doing your painting, or a mule-driver you have hired. It deserves, indeed, a place in every household. T. C. TURNEY.

—Nevada, Ohio, February 5th, 1901.

Preface.

The object of this book is to convey, in the simplest and plainest way possible, to the amateur painter, information which will help him to acquire a thorough knowledge of painting; and to aid, with suggestions, those who, having had some practice, fall short of that excellence which it is desirable to attain.

The information herein is the result of years of experience, practice and study, given in the shortest way, so as not to flustrate the beginner, or waste time for the more experienced in reading lengthy descriptions with but little profit. The information within these pages is for your private use, and should be kept as such.

CHAPTER I.

Painting Wood Work, etc., on Interior of Buildings.

First of all see that the work is smooth and well dusted down. If the work you are going to paint is finished in pine, give it a coat of shellac first, which can be bought ready for use. This dries quickly, and as soon as you have coated all the work, run over it with some old, worn sandpaper; (not too badly worn,) and smooth it nicely. Then it is ready for the first coat of paint.

Boiled or raw linseed oil should be the principle oil for thinning the first coat of paint, using boiled oil if you are in a hurry.

Take white lead, make it the desired color, by mixing in the coloring, while the lead is quite stiff, which mashes up any particles of color, and distributes the color more evenly through the lead, adding a small amount of the coloring at a time until the desired color is obtained. Color as much lead as you think it will take to coat the work three times, then put in the japan. If the japan is good, use about one ounce to the gallon of the mixed paint when thinned ready for use.

Take of this colored lead enough to first coat the

work; thin with raw or boiled linseed oil as your judgment will say; though if you use the raw, use more japan; thin nearly to the proper consistency with the oil; then finish with turpentine. If you wish you can omit this coat where the work has received a coat of shellac.

For first coat (not priming coat) it will take about one gallon of oil and one pint of turpentine to twenty-five pounds of white lead. You must use your judgment with regard to the thinning of your paint, for there can be no exact rule laid down for this, for the pigments are not always of the same thickness and density. However the above rule will be a good guide for the beginner.

Now provide yourself with a small brush, such as a No. 5, sash tool, or a one inch, extra extra, flat varnish brush, for tracing or painting any parts you can not do with a large brush; and a No. 5-0 or 6-0 round paint brush, or a flat wall brush, three and one half inches wide. Always get the best, they are the cheapest; good work being impossible with poor tools.

Now you are ready to give the work the first coat. Apply the paint smoothly and evenly. Do not get in a hurry. Make long, sweeping strokes with the brush. Avoid the short, jerky movement.

Paint the windows and doors, always painting the highest work first.

Do not use too much paint, nor too little; but just enough to give it a nice even coat. The first coat should be well brushed into the wood, which makes it adhere better. The object of the first coat is to secure

a foundation for the following coats. The second and third coats are decorative, or color coats. Be sure to get a coat of paint in all indentations and nail holes, that the putty may have something to adhere to.

About twenty-four hours after you have applied first coat, test it by running the finger nails over the surface; and if it does not scrape up under the finger nail, then it is ready for the second coat. But before second coating you should putty and sandpaper the work. Make sure that you fill all holes, even full, for if you do not, they will look hollow after the work is finished. For this kind of work use oil putty.

Now take the balance of the colored lead, and if you wish to finish the work in flat, or without a gloss, thin the lead with turpentine. Or, if you wish to finish with an oil gloss, and not varnish, thin the lead with half linseed oil, (boiled oil if you are in a hurry;) and turpentine. Apply evenly, or flow it on the work; but not heavy enough to run. The paint should be thin enough to flow out nicely, and yet not too thin to cover well. If the color is white, or very light, it will take more coats than if dark.

If you wish to varnish the wood work, or whatever the surface may be, then you should apply the second and third coats in flat color, as it varnishes much nicer. Should the color be dark, you can use dark varnish; but if light, you should varnish it with good demar varnish, though it is very hard to get a demar varnish that will dry well. Avoid the use of demar varnish if possible.

It is not necessary to shellac any other wood than

pine. The shellac is to prevent the pitch that is in the pine from penetrating the paint, which leaves dark spots on the surface and looks badly. Knots should be shellaced with heavy, dark shellac, which will stop them out very well, always shellacing the knot after the priming coat is on. If shellaced before, and on the bare wood, in time it will scale off, taking with it the paint. The general idea is to shellac them the first thing; but that is a mistake.

If you desire to kill the knot, so it will not show through, follow these directions: A mixture of glue size and red lead; or shellac dissolved in alcohol and mixed with red lead; or gutta percha dissolved in ether. Either of the foregoing make a good coating for knots, but will not stand the sunshine, which will draw the pitch through the paint. The best method is to cover the knot with oil size, and lay a leaf of silver or tin foil over it. This will stand the sunshine very well.

CHAPTER II.

Painting The Exterior of Buildings.

THE PRIMING COAT—Always use Venitian red for the pigment, unless the building is to be painted white, or a very light color; in which case use French yellow ochre, or white lead, though would prefer the white lead to the ochre.

If the small extra cost is no objection and a primer of great durability is required, use red lead for the pigment, using about eight pounds of the pigment to a gallon of oil. However the condition of the weather should regulate the amount of lead to be used. A small quantity of lamp black added to the mixture will be advantageous. Keep the lead well stirred up during the time of using it.

The priming coat should be thin, using about seven pounds of Venitian red to one gallon raw linseed oil. You might use a little coach japan to accelerate the drying some. The priming should dry slow, to give the wood a chance to absorb as much of it as possible; and for this reason would not advise the use of any japan in warm weather.

When applying the primer, rub it *thoroughly* into the wood, checks, cracks and nail holes. Putty will not adhere well to bare wood.

I do not advise the use of yellow ochre for a pigment for priming, because its affinity for the coat to follow is not very great. This is one of the causes of so much paint peeling off from the priming coat.

Do not hurry over the work too fast when priming, as usually is the case; but take a little time, and apply it well. This is the key to success in most any application of paint.

After the priming is *thoroughly* dry, then all cracks, checks and nail holes should be well puttied, and all knots shellaced.

To putty correctly, force the putty into the nail hole with the thumb of the left hand and shove the putty knife under the thumb with the right hand, cutting the putty off and leaving the hole even full. Puttying up with the finger is a barbarous practice, and does not fill the holes well.

Sandpapering and dusting should be done before puttying, as it is apt to hollow, or dish out the puttied places.

THE SECOND AND THIRD COATS.—It may be proper to give the beginner some idea, now, as to how much paint it will take to paint a building; which will show you how much paint you will need to procure and how much to mix. It is a saving of time and keeps the feelings in good condition, to be able to know just how much paint it will take to do the work.

First, find the number of square feet surface in the building, including cornice, gable ends, etc., then add one fifth to this, if a plain house; and, if there is considerable fancy work, such as brackets, grill-work, etc.,

add one sixth, for edges of siding, frames, corner strips and many things which would take too much time to measure. Now divide the number of square feet surface in the building by 250, the number of square feet one gallon of paint will cover, (two coats) of new work; or, old work, if not in too bad condition. This will give the number gallons of mixed paint.

(EXAMPLE)

Front of house.....	20 feet wide
Rear of house.....	20 feet wide
Side of house.....	40 feet long
Side of house.....	40 feet long
	120
Multiply by average height	21
	120
	240
	2520 sq ft.
Five per cent added	126
	146
Divide by.....	250)2646(10 ———
	250 250
	146

10 and 146-250 gallons mixed paint, (two coats.)

Now, I believe, we are ready to mix the paint for first coat; or, for that matter, both second and third; though would advise you to mix second and third coats separately. Twenty five pounds of lead will make, on an average, three and one half gallons mixed paint.

Provide yourself with a tub, half barrel, or something large enough to mix sufficient quantity to second

coat the building; one vessel for the body color, and one for the trimming color. If you will carefully follow the directions given below, you will be able to mix a paint as good as can be procured, no matter who would make it.

First thing of all, buy the best, pure white lead, from a reliable house, and the very best linseed oil; for the best is poor enough. (On another page is given a test for linseed oil.)

Now put the required amount of lead in each mixing tub, with a little oil to soften it enough that it can be stirred with a paddle; but it must be quite stiff. Add to the lead one tenth zinc. If the paint is to be colored now is the time to add the coloring while the pigments are stiff. Make it any desired color; and after it has been thoroughly mixed, then add the drier. The time of year will suggest the amount to be used, cold damp weather requiring more. However do not use too much at any time; for too much oxigen is not good for the oil. This all being done, you are now ready to put in the oil, which should be half boiled and half raw linseed oil. But if the weather is cold, would not use quite so much raw oil, and more boiled. Ordinarily this mixture will stand one and a half gallons oil, to twenty five pound of lead; yet there is no rule to govern the amount of oil to be used in the thinning of any paint, for several reasons: First, the density of the pigments is not always the same; the condition of the surface, and the state of the weather are not always alike .The presence of all or any one of these conditions would change the amount of oil to be used.

The paint, when ready for use, should be heavy enough to make a nice coat; but should have oil in sufficient quantity to bind the pigment to the priming coat. You will be more certain of getting a good job by having the paint a little thin than too heavy. It is all right to allow some of the oil of second coat to dry in the wood, which fixes the second coat to the priming; but the oil of the third coat should dry on the surface, thus giving it much more gloss, and keeping more oil in the pigment, and increasing the wearing qualities.

These coats should be applied as evenly and smoothly as possible, always remembering to brush the paint on well.

Paint mixed in this way, and carefully applied, will not crack, peel or chalk off, and will do credit to the painter and give satisfaction to the person owning the building.

CHAPTER III.

Natural Wood Finish for Interior of Buildings and Furniture.

The carpenter should leave his work smooth and clean. It should be filled soon after, to prevent the grain of the wood from raising.

One of the best wood fillers, that needs only to be rubbed with the grain, (but would advise that it should be rubbed across the grain, for think it fills the grain a little better.) This will not shrink; it gets as hard as the wood, and can be varnished soon after filling:

Mix equal parts of coach japan, turpentine and boiled linseed oil; then stir in plaster of paris and pulverized whiting, until it becomes a thin paste; rub this on the wood (with the grain) with an old brush. Rub into the grain of the wood well; first across the grain, then with the grain, using shavings or excelsior. After this, wipe off all surplus filler with a rag, making sure to get all the filler out of beads, etc. This must be done before the filler gets set too much.

After the filler has dried, then sandpaper with the grain of the wood, with number one-half sandpaper, as the work may require. The friction of the paper hardens the filler immediately.

Again, I have stirred plaster of paris into turpentine; and then put in just sufficient linseed oil to keep it from setting too quickly. However this is not so good as the former; as it will raise the grain of the wood. This should be used for cheap work, only.

You should color the filler for walnut wood with burnt umber; and for antique finish on oak, etc., color with raw umber.

After the filling is done, then you should putty all places that need it; and be very careful not to smear the putty all over the surface, which will make the work look dirty and nasty; but put the putty right to the place needed. The putty should be colored to match the wood as nearly as possible.

The work filled, puttied and sandpapered, the next step is to varnish it. You should procure a good interior varnish. I prefer rubbing varnish to any other finish.

Before varnishing walnut, if you wish to bring out the richest color of the wood give it a light coat of boiled linseed oil. After this is dry proceed with the varnishing; though remember the use of linseed oil will darken any wood in time. So if you wish to preserve the wood in its natural color, use as little linseed oil as possible.

The varnish pot must be clean; also the varnish brush. Both should be free from any dirt or sediment whatever. The work must be thoroughly dusted off, and the room perfectly clean, or as nearly so as possible. Remember, the more careful you are in these things, the better the finish when complete.

Cheap work can be finished with one coat of varnish; but for first class work it will require two or three coats. If you have made a good job of filling the grain of the wood, two coats will do as well as three. What is desired in a finish is to have the grain of the wood filled up even with the highest parts, thereby making a level surface; and to hold the varnish up so that the entire surface looks like glass, perfectly level and smooth. So if this can be done with two coats, all the better for the work, and a saving of time and material. Do not spoil the work, however, just to save one coat of varnish. All directions given in this book are for the attainment of the very best work. If you can do the best work, you will soon learn to do it in a cheaper manner, if necessary.

After the first coat of varnish is on, and is dry and hard; which will take from twenty-four to thirty-six hours; (and some varnish longer than this,) it should be sandpapered with No. one-half sandpaper, or finer, if you should find it too course. All sandpaper does not run alike. Be most particular regarding the sandpapering, for this is what levels the surface.

Dust off the work very completely, making sure to get all the dust out of the beads, corners, etc. Now it is ready for the second coat of varnish, which must be applied very carefully, giving it a good heavy coat; but be very sure to have no runs or sags, which will leave their mark always. Would advise the amateur not to use too much varnish in the beginning, but as you have had some practice, you will gain confidence in yourself, and can use more.

In the description of how to varnish a carriage body, you will learn how to apply the varnish, how to take care of the brush, and what kind of brushes to use.

If you desire a dead gloss, or dull finish, it can be obtained by rubbing the last coat of varnish with pulverized pumice stone and raw linseed oil; rubbing the surface until all specks are removed and the surface looks quite dull, (this rubbing process must not be done until the varnish is thoroughly dried; and will state here that each coat of varnish, except the last, must be sandpapered before the next is put on.) If the work in hand is a small piece of furniture, or other small work, you can rub the entire piece before wiping it off; but if the wood work of a room, do not rub more than a door or window; then wipe the pumice stone and oil off with a soft rag, or soft cotton waste. Be sure to wipe surface clean and dry. Use a pad of plush, or a piece of heavy felt, out of an old hat; or you can buy a piece of rubbing felt at a paint store.

If you would prefer to have it highly polished, then re-rub the surface with rotten stone and linseed oil, after you have wiped the pumice stone and oil off. Rotten stone cuts slowly; but it is not so much in the cutting as in the polish, though to be sure it is to take out all scratches which the pumice stone has made. When through rubbing with the rotten stone, wipe it off with the very softest rag you can procure. Cheese cloth is a very good thing. Now if you desire to make the surface still nicer, take Turney's Piano Polish, after the rotten stone is wiped off, and go over the entire surface according to directions given on bottle,

and wipe this off with cheese cloth. This will remove the smoky and greasy appearence left after polishing with the rotten stone, giving it the most beautiful finish and that brilliant appearance so long wished for.

Close grained wood, such as pine, poplar etc.. should not be filled with oil filler as mentioned in the fore part of this chapter. The grain in such woods being very close together, will not take up any of the filler, and would make it look muddy. Such woods should only be shellaced with white shellac cut with alcohol, or white oil shellac; oil shellac being preferred in some cases, as it does not dry quite so fast.

How to make oil shellac.—Melt the shellac in an iron pot, and then mix in the oil by thoroughly stirring it. This will not dry as quickly as shellac cut with alcohol.

Out side doors and exterior natural wood finish is finished in the same manner as interior finish, except that you must use an exterior varnish.

Varnish made for inside use will not stand on outside work. Outside varnish gives away very quickly, therefore you should make sure of the very best.

Natural woods, exposed to the weather, should be finished once a year, though a good deal depends on the exposure. If the finish is left go until the wood becomes weather-beaten, it makes it unfit to finish again, as the surface of the wood is ruined.

CHAPTER IV.

Staining Natural Wood to Imitate Walnut, Cherry or Rose Wood.

FOR STAINING WALNUT.—Take burnt umber and mix with boiled linseed oil to make it transparent, and turpentine to cut it; about two-thirds oil and one-third turpentine, and a little coach japan to dry it. All stains must be quite thin or the color will be too dense, and would cover up the grain of the wood.

Elm, white pine and poplar make good woods for walnut staining, though you can stain over most any wood; but the above mentioned will make the best imitation.

If you desire to make an extra good imitation of walnut, apply two thin coats of staining color.

Apply with a brush, with but a small quantity of the stain in the brush; and if you should get too much on the wood, take an old piece of muslin and wipe off the surplus; or wipe it off until it becomes as light as you think it should be to resemble the natural walnut.

CHERRY STAIN.—Use burnt sienna with a little asphaltum to subdue the red cast of the sienna. Mix in the same manner and apply it the same as the walnut stain; only it should be thinner.

ROSE WOOD STAIN.—Use pure burnt sienna and mix the same as the walnut stain. Have a little of the pure sienna, and a little asphaltum in small cups; and with a small brush, (such as a half-inch fresco liner, or something of that kind,) run small streaks in with the grain of the wood, such as you will see in rose wood; and then with the larger brush run over the streaks lightly to blend them out nicely. Be careful not to cover up the grain of the wood too much. Running these streaks in over the staining is called over-graining.

After this staining is dry, which will take about ten hours, run over it with cocabola. If a deep rich shade is desired, give the work two coats of the cocabola.

The best wood for staining over for rose wood is birch, or second growth poplar.

After staining, let the work stand for eight or ten hours; then proceed to shellac and varnish; and finish according to the directions given for varnishing natural wood.

Extreme care should be used in sandpapering after the staining is shellaced; for should you rub through the staining to the bare wood, it would have to be touched up with some stain, which is sure to make spotted looking work.

CHAPTER V.

Painting Plastered Walls in Oil and Distemper Colors.

PREPARING THE WALLS, or giving the first coat.—Some painters and decorators give the walls a coat of glue size to close the pores, or stop the suction of the plaster; though this is not a very good thing to do, for the reason that, should the walls sweat, which they very often do, it would soften the glue size, and destroy the foundation; and there could be but one result —the paint must fall off.

You will very frequently find damp walls, and more especially in brick buildings; and in such places it is very hard to get the glue to dry properly; and if you should succeed in doing so, it would stand but a short time.

A few remarks regarding damp walls may not be out of place here:

Dissolve half a pound of alum in a gallon of water; then put in half a pint of raw linseed oil. The oil will prevent the cracking, and you can either paint, calcimine or paper over it.

DAMP WALLS again. A splendid remedy: "Mix English Portland cement with water to the consistency

of cream; give the walls (either brick or stone) a thick coat, stirring the cement all the time while using it; and only mix half a gallon at a time, and work quick. This looks at first a failure, as it can easily be brushed off, but after standing twenty four hours, it becomes thoroughly hard. This is used best on damp days. Two coats better than one. This is used only when you wish to paint outside, damp brick or stone walls."

To Dry damp walls, and make them fit for papering.—Get some sulphuric acid, and with an old paint brush wash over the damp places. This is a certain preventative for damp walls.

Cooling plastered walls—Dissolve half-pound white glue in hot water to the consistency of jelly; and stain it with a little dry drop black. Then mix half pound of plaster of paris with the glue. Apply one coat of this, after which go over the work again with a solution of equal parts of alum, brown soap and glue, mixed to the proper consistency. If you wish, you can mix boiled linseed oil; but if oil is used the work must stand for a day or so. You will find this to surpass all preparations you have tried.

Glue size is much cheaper than linseed oil; but suppose it is, what does it amount to? It will not justify you to use it; for should you use it, in a short time the job may burst up and cause you endless trouble; and, perhaps, your reputation, for just a few stingy pennies.

To prepare one of the best size for a plastered wall is very simple.—To one gallon of boiled linseed oil add one fourth pint coach Japan. This will dry the

oil in a short time, allowing enough of the oil to penetrate the plastering, and thus putting the walls in good condition to receive the after coats. This sizing can be applied with a flat, wall brush; and care must be exerted not to use the size too extravagantly; for what oil the plaster will not absorb, will have to dry on the surface; and if too much is used, it will sag and run down the wall, leaving the wall in a bad shape.

The object of this oil size is to have as much dried on the surface as possible; and to do this it must be dried quickly, which will produce a gloss over the entire surface, thereby closing the pores of the plaster, and putting it in shape for the first coat of paint; though, if the entire surface should not be glossy, it will make no material difference. This size should stand twenty four hours under good drying conditions before applying the first coat of paint; or, in other words, it must be dry and hard before proceeding with the work. NOTE.—An addition of a small quantity of white lead, (tinted with a little yellow ochre), to the size, will greatly improve it, as it will act as a filler.

All holes, such as nail holes, or larger ones, should be filled with plaster of paris before sizing the walls.

MIXING AND APPLYING SECOND COAT OF PAINT TO WALLS—PUTTYING CRACKS ETC.—MAKING WALL PUTTY.—This putty is called quick drying putty, and is made of equal parts of pulverized Whiting, (lump whiting will do) and plaster of paris, mixed to a soft putty, with equal parts of quick drying rubbing varnish and coach Japan. Mix on a sheet of tin, marble slab, or a large board. Place the whiting and plaster of

paris on the marble, tin or board (which ever is the most convenient) and make a hole in the center of the whiting and plaster of paris. In this hole pour the varnish and japan, enough to make it all into a stiff putty; then with a putty knife, mix all together; and after well mixed, take a hammer and pound it to make it smooth. Now, the putty being made, put it in a pint cup, or other vessel, and cover it with water to keep it from drying out.

Now, the sizing dry, and the putty made, you are ready to do the puttying of all cracks and small holes. Provide yourself with a piece of glass, three inches square, and a small cup of turpentine. For the larger holes, etc., use the putty as made; but for the small cracks and checks the putty must be thined some. By putting some of it on the glass, and by dipping the putty knife in the turpentine, and working the putty with the knife, and repeating this opperation until the putty is thin enough it will go in the cracks easily. Now take a small portion of this putty on the knife, and run along over the crack, pressing the putty in as you do so, making sure the crack is filled. Put the putty right in the crack, or hole, and scrape off all putty left on the out side of the crack before the putty gets dry. DON'T FOTGET THIS.

This putty dries very fast and can be painted over as soon as the work of puttying is completed.

CHAPTER VI.

The Finishing of Walls in Oil Finish.

In the oil finish, the second and third coats must be mixed the same color; and, for this reason, there shoud be enough paint mixed for second and third coats. Should the second and third coats fail to cover and make a nice even color on the walls, a fourth coat should be applied.

Having decided on the color of the walls, and the quantity of paint required, we will proceed to mix it.

Use white lead, of good quality, and into the lead add the required colors, ground in japan, to make the color desired; always stirring the color into the lead while it is quite thick, to make sure that all particles of color are well broken up. If this is not done they will rub out when coating the walls, making great streaks, which are difficult and tedious to remove.

Now, the lead colored the desired shade, the pigment is ready to be thinned.

As formerly stated, there can be no precise rule given by which to thin any paint, as the density of the pigment, or the strength of the color, is seldom alike. However, a very good proportion for this kind of work, is seven eighths gallon of boiled linseed oil, one eighth pint of coach japan and one pint of turpentine to twen-

ty five pounds of lead. If you find this a little too heavy, add a little more turpentine.

Apply this coat in the same manner you would any coat of paint. Make sure that the paint is evenly distributed. This can be done by first laying the paint on the walls crosswise, and then brushing it out the other way; always finishing by stroking up and down.

The best brushes for coating walls with, and for making speed, are six inches, best quality, O K. Kalsomine brushes. They may seem large and awkward at first, but after you have become accostumed to them you will use no other. To use these brushes you need a large pail; and there should be a heavy wire run across the middle of the bucket at the top, to wipe off the brush when using; as this is the secret of keeping the paint from runing down the brush when working on the ceiling, just take paint enough in the brush to cover one streak, a brush wide, on the ceiling. In this way you keep the paint out of the heel of the brush, and there is none to run down on the handle. But if any should get in the heel of the brush, wipe it out by wiping the brush across the wire in the bucket.

Give the walls as many coats as they may require, two or three, besides ths sizing.

You will get some idea how to treat the room in the following pages, as regarding some decorations. If you desire to use the stippler on this finish, you will find directions in the following chapter.

Walls and ceilings finished in oil finish, are not intended for fine rooms. Such finish is mostly used in kitchens, bath rooms, basements, and for cheap finish

in offices.

Hoping the foregoing remarks are plain and explicit, we will now take up the subject of distemper color.

CHAPTER VII.

Finishing the Walls in Distemper Colors.

GENERAL OUTLINE OF THE WORK.

Now we suppose you have a design, or an idea how you want to finish the walls and ceiling. But to help the beginner I will give an outline of a plain finish for a room, and which, if followed out, will look very neat.

We are beginning now, after the wall, is prepared as in the preceeding talk on oil finish, which is after the first coat of oil finish is on. In other words, to make it plain, the walls have recieved the coat of oil sizing as spoken of, have been puttied and had the first coat of oil paint after the puttying. Now we are ready to lay the work off with rule, chalk line and a piece of white chalk.

Supposing the room to be twenty by twenty feet, and twelve or fifteen feet high. For a room this size the styling should be at least twenty inches wide. Therefore strike a chalk line around the ceiling twenty inches in from the walls. The field, or center of the ceiling, inside of the chalk lines, should be painted a rich cream color, made of white lead, yellow ochre and burnt sienna. The walls and styling outside of the chalk lines may be made an amber color, made of

white lead yellow ochre, burnt sienna and burnt umber. In the field the yellow ochre is the predominating color, with just a touch of sienna to make it rich. Do not make it any darker than cream; but in the wall and styling there is much more ochre and sienna used and just a touch of umber. There should be difference enough in the field and wall color to be noticeable; yet not too much contrast. There should be contrast, and yet it should be harmonious. This combination, with antique oak finish, looks beautiful.

THE STRIPING and stenciling may be done with some of the wall color, made enough darker with the ochre, sienna and umber to make it plain; but do not make it too dark. There should be a broad line, say one half to three quarters of an inch wide, covering the edges of the field and the styling colors; and there should be a fine line, in on the field color, four inches in from the broad line, one eighth of an inch wide, and one of same width on wall, twenty inches down from ceiling. The border should be stenciled above this line. In this idea of a combination three colors are required to complete the design.

The first thing to do on commencing the painting of a room is to erect a scaffold; one on which you can paint ceiling and walls. It need not be a tight floor; but should have boards enough to walk around on conveniently.

MIXING THE DISTEMPER COLOR.—Provide yourself with clean tubs and buckets, or cans enough to mix as many colors as are needed.

Now mix as many colors as there are required to

cover the large surfaces, such as the field in the ceiling and the walls. The decorating colors can be mixed when the work has reached that stage.

The coloring is applied to the lead in the same manner as for all mixing. When mixing colors for distemper painting, the coloring should be ground in japan, as it gives a much purer color, and the paint dries much flatter. If mixed with colors ground in oil, it has a tendency to give the work an eggshell gloss. Now the colors all made up, they are ready to receive the thinner, or vehicle, which is nothing but turpentine. Flat colors, (this is a term used for distemper colors,) are used some thinner than for oil paint; and care must be exercised in the use of them—not to splatter and throw the distemper all over everything.

It dries very quickly and can not be worked in a room where there is a draught passing through.

The same kind of brush can be used for applying distemper color as for oil paint—that is, a six inch kalsomine brush, using the large bucket, with the wire through it to wipe the brush on.

Distemper color works very easy on account of its thinness. This coat of flat color must be finished as you go; and after once on, and finished, must not be touched again; for, if touched with the brush, in order to fix up some mistake or otherwise; or, is brushed against before it is dry, it will make a glossy spot and look bad. Spread it on as evenly as possible, avoiding any laps of the brush, streaks, etc. Be sure to keep edge of the distemper moist all the time while coating across the ceiling or walls. If the edge is allowed

to set before getting back again to run another brushful on, it will make a streak; and will also be glossy. Two coats of flat color are plenty, and if care is taken the walls will look perfect.

STIPPLING THE WALLS.—Stippling the walls improves them in small rooms where the work comes in close contact with the eye; however it is not necessary. The use of the stippler is to take out brush marks, and to give the surface a rough finish. The brush is as follows: The best size for use is one three inches wide, eight inches long, with bristles three inches long. The brush is used by following closely the person spreading the flat color and striking the fresh paint with the ends of the bristles, thus taking out all brush marks and making a very nice rough surface. This brush must be used only when the paint is just put on. After the stippling is finished the brush must be washed out perfectly clean and laid away to dry, being careful that the hairs do not spraddle out. A good plan is to have a box to just fit the brush, in which to keep it.

Now the work is ready for striping and stenciling.

CHAPTER VIII.

How to Do the Striping.

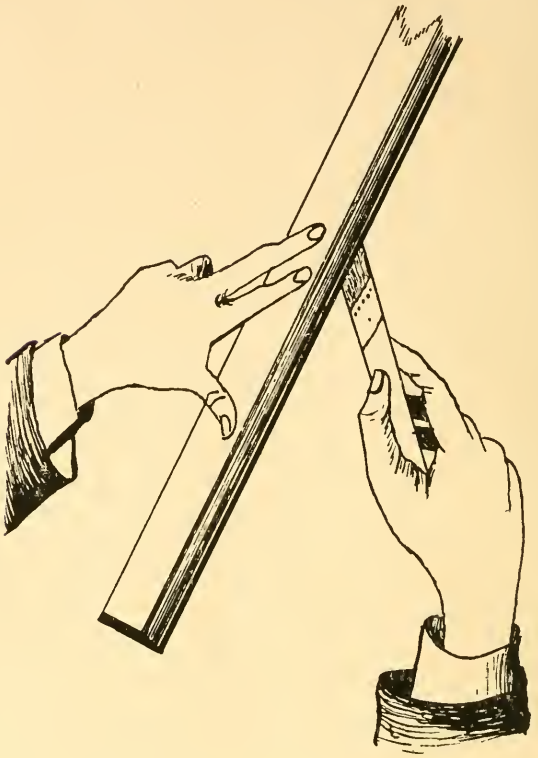
Provide yourself with a straightedge made of white pine, four feet long, three inches wide and three sixteenths of an inch thick, with one edge beveled three-eights of an inch back from the edge, and leaving the edge one-sixteenth of an inch thick. This will make quite a limber straightedge, which is necessary for this kind of work, as it will need to bend easily to fit the uneven places in the ceiling. Now get a fresco liner, a No. 1, or say one inch wide, oval, (all brush makers do not number the same,) and a No. 14, flat fresco liner, one inch wide. This brush is made one inch wide, and about three-sixteenths of an inch thick, with the hair set in the end of the handle slanting and one-half inch long. If care is used you can run a fine line perfectly straight and with respective symmetry.

Make up the striping color as stated in the foregoing outline, making it a little darker or lighter than the walls, just as your taste may dictate. Striping color must be thinner than ordinary paints so it will spread out easy under the brush.

Now you have the tools and color ready, you are prepared to commence the striping. The first line we will run will be the the broad line, which we will make

three-quarters of an inch wide. Place the straight-edge on the ceiling, on the out side of the field line, with the beveled edge next to where the field color and the styling color come together; just far enough away to allow the line, when run on, to cover up the edges of the field and styling colors. (You will see at once by this that it will be necessary when coating the field of the ceiling and the styling to cut the edge of each color quite straight with the chalk line, so the broad line can cover both edges) Hold the straightedge firmly to the ceiling, not allowing it to slip or turn while running the colors on. Now, while the straight-edge is in this position, dip the No. 1, fresco liner in the color and then place it with flat side to the straight-edge, and press just hard enough to flatten it out to make a line three quarters of an inch wide; and run it along the entire length of the stick, repeating this operation until you have gone around the entire panel; being careful where you join on each time you change the straightedge to have the line of uniform width throughout. With this broad line run in, we are ready for the fine line This line should be run in on the field color, at a distance far enough from the broad line to relieve it; say three or four inches. This line should not be wider than one fourth inch, and would look better if only one-eighth of an inch wide. With practice you can make a very fine line with one of these flat, fine liners. The fine line is made in just the same manner as the broad one, only you use the flat inch brush, previously spoken of, instead of the oval inch fresco liner. You place it, charged with

color, flat side to beveled edge of straight-edge, little slanting from you and run it along the entire length



SHOWING POSITION OF BRUSH.

of stick, just fast enough to allow the color to flow from the brush. The width of the stripe depends upon just how hard you bare on the brush. The straight-

edge must be wiped off occasionally to prevent daubing the work.

When striping the walls more care must be taken as there is danger of the color running down behind the straight-edge and having the stripe ragged on the lower edge. A little care will obviate this.

If you want a broad line, one wider than the liner will make, just run two parallel lines, allowing them to touch all the way. In this way you can make lines of any desired width.

CHAPTER IX.

Stenciling, or Decorating.

Stenciling is flat ornamentation, and can be treated in a variety of ways. An ornament can be made in plain, straight stenciling, with but one stencil, or can be made with several different stencils of different parts of the ornament, with plain and blended colors, making the whole very elaborate and attractive.

The first thing required is the stencil. These can be bought, if you can not make them; but I would advise that you make them if you can possibly do so. You should endeavor to be original in all your work. Self-reliance and originality are among the greatest attainments.

If you wish to make your own stencils, draft them on good, heavy drafting paper, leaving plenty of bars, or ties, in the pattern to hold it together well. Have a glass fourteen inches square, or such a matter, and place the pattern on the glass. With a sharp-pointed knife proceed to cut out the stencil. By cutting it on glass, both sides of the stencil will be smooth, and either side can be used. Prepare all the stencils needed for the work, then you are ready to decorate the room in flat ornamentation.

If you wish to decorate the ceiling with corner

pieces, make a stencil of the proper size to suit the panel, and with thumb tacks fasten it in positon in the corner of the panel. Mix the colors you wish to use on the design, using one, two or three colors if you can, and wish to.

If the stencil is large, you can use a large brush for putting on the color, say a number six naught, round paint brush; one somewhat worn is better. Never use the round stubby stencil brushes which are for sale. The size and character of the stencil will suggest the size of brushes required. You should have a brush for each color you intend using on the pattern. If there are rosettes in the design, make the center of them a dark color, and the out edge the lighter color; being careful not to use too much of the dark; for when blending the two colors together, the dark will cover too much of the rosette. This work must be done quickly and decided in the motion, for the blending must be done while both colors are wet. After both colors are on the rosette take the dark-colored brush, nicely wiped out, and in a circular motion, and at the junction of the light and dark colors, rub the brush over the stencil, which will blend the colors together nicely and give a pleasing effect. This is the principle employed in blending two shades together whether on straight or circular work. If there are leaves, vines or the like in the pattern, they can be blended in the same way, using the colors to the best advantage to suit the character of the leaf. Care should be taken not to wipe the brush against any of the edges of the pattern, which is most likely to run

some of the paint under the paper, and blot, or spot the work. Be sure to have the paint evenly distributed through the brush, which can be done by having a board to rub the brush on after dipping it in the paint.

Coat in all the corners in the same way; and if you wish to put a center piece in the panel, just stencil the corner pattern four times, placing the corner of the pattern to the center and at right angles with each other. After coating in all four of them, connect them together with any lines that may suggest themselves that may be utilized in this manner. Now connect the corners with each other by running a line along the side of the panel at an equal distance from the broad line at the edge of the panel. The breaks, or ties, which were left to hold the pattern together, may now be painted in, if you desire, which will make the pattern look as though it had been executed by hand. They can be painted in with a small fresco liner, or an artist's brush, using the same color the ornament had been stenciled with. When the ceiling is finished, choose some appropriate design for a border and stencil the same on the wall fifteen to twenty inches from the ceiling, the highth of the room regulating the width of the border.

As you advance by practice you will become more familiar with the ways of doing the work, and can finish it more elaborately.

In the latter part of this subject you will find a few combinations for ceilings and walls. Do not get discouraged with the work at first attempt. "If at first

you don't succeed, try, try again." Always remembering that "there is no excellence without great labor."

THE WASHING OF THE STENCIL is very simple. Place it on a board and dip a painter's old duster in some turpentine and rub it over the surface of the stencil, repeating until the paper is free from the paint; then wipe it off dry with a cloth, when it is ready to be laid away. If you are careful with the stencil it may be used several different times. Should any of the bars holding the pattern together become broken they can be repaired with a piece of heavy court-plaster.

CHAPTER X.

Washing Walls Painted With Distemper Colors, or Finished With Paint Mixed in Oil.

WALLS and ceilings finished in oil or distemper colors, can be washed and made to look as good as new, provided they have not been neglected and left stand too long before washing. Should they become so very dirty it would be almost impossible to wash them; and should you wash them under such circumstances they would not look very well after the work was finished; for the reason that the washing solution would have to be very strong, and the surface of the paint rubbed so hard that there would be very much danger of destroying the colors, making them look much lighter and spotted in many places. In all instances you should advise the washing and cleaning of rooms before they have become too smoky, dusty and greasy. It will be money to the owner of such rooms in the saving of time in doing the work, preserving and lengthening the life of the paint, thereby making it possible that the walls be washed many times and yet look as good as new. And by so doing you save trouble for your-

self, as the work is much easier done, looks much better, doing credit to yourself with such results.

To wash the walls and ceiling.—Have two buckets that will hold, say two gallons of water, (however, nothing particular about the amount of clear water.) Fill them two-thirds full of soft water. Use one for the washing fluid and the other to wash off the walls after the washing solution is put on.

To make the saturated solution.—Put five pounds of salsoda into a bucket large enough to contain it, and one quart of soft water. Set this on a stove and heat it until the soda is dissolved; then it is ready for use. Put a half pint of this saturated solution into the bucket containing the water, which will make it feel quite slippery to the fingers. There can be no set rule for making the washing fluid, as the walls may require a weak or a strong mixture to clean them. You will have to put a little in at a time and try it in order to ascertain the correct amount. But you must be very particular to remember the exact amount of the saturated solution put in the clear water, and the amount of clear water in the bucket. This will enable you to make each bucket of the fluid of the same strength.

EXAMPLE:

Saturated Solution—5 lbs. Salsoda.
1 quart Soft Water.
Washing Fluid—15 lbs. Soft Water.
1 pint Saturated Solution.

This followed out, using the required amount each

time the water is changed, will insure an even-looking job when through. If the walls are very dirty they will require more of the soda; and if not in bad condition, less soda. Be careful not to use any more of the soda than is needed; for if the water is charged with more of the soda than is required, it will take the paint off.

One man can do this kind of work; but it is much better if there are two. One man can take a sheep's wool sponge of a convenient size, with the washing fluid, and go over a space from four to six feet square, rubbing until the dirt is all loose; then the other man, with a sponge of same description, can take the clear soft water and go over this surface and wash off all the loose dirt and the soda; and if the strength of the fluid is just right, the washing has been done with care, and you have cleaned it thoroughly with the clean water, you will be highly pleased to find the work look just like new.

Do not let the soda water, or any of the clear water, run down over any of the unwashed walls; nor get them wet in any way until you are ready to wash them. Each place you touch, or let the water run down over the unwashed walls, will make a spot; and you will have trouble to get it out, if you should succeed in removing it at all. Change the water as often as needed.

In washing varnished work the water must not be charged with quite so much of the soda, as it kills the varnish, or turns it white. You can soon tell if it is too strong, for you can shortly smell the varnish.

CHAPTER XI.

How to Grain in Oil Color.

First, if it is new work to be grained, it must receive three coats of paint; the surface must be smooth and even. The color of the background for oak graining should be made with white lead, yellow ochre, burnt sienna and burnt umber, approximately as follows:

White Lead	25 pounds.
Yellow Ochre	¾ "
Burnt Sienna	⅛ "
" Umber	1-16 "
Boiled Linseed Oil	¾ gallon.
Turpentine	¼ "
Coach Japan	¼ pint.

As a rule the grounding color for graining antique oak is too light in color. The white should be colored with the ochre until it is considerably darker than a cream color, then the sienna is added, enough to give it the terra-cota, or dull pink cast. Now add the umber to throw it in line for the color of the light parts of the oak. Herewith is a sample of the color the background should be for antique oak graining:

GROUNDING COLOR.

Two coats of ground color over old work which has been painted before, will be sufficient. Sandpaper the work well before first coating.

Putty and sandpaper after the first coat; then second coat, and let stand until thoroughly dry—then the work is ready for graining.

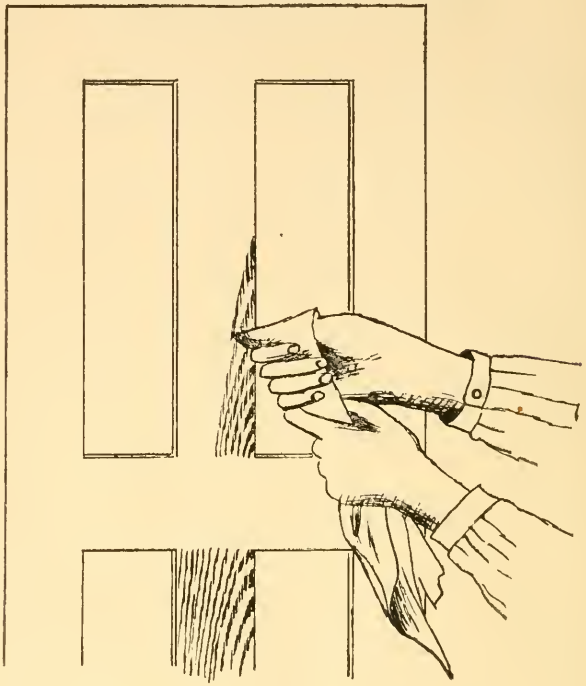
MIXING THE GRAINING COLOR FOR OAK.—Take raw umber ground in oil, as much as you think will do the graining. One-half pound will make one-third of a gallon of graining color ready for use. Thin with two-fifths each, boiled linseed oil and turpentine, and one-fifth good japan drier. Make it thin—about the same consistency as for staining. Those who are not familiar with this kind of work, should coat a piece of board with the ground color, each time when painting the room, or work; for the purpose of testing the consistency of the graining color. If you find it too heavy, thin with more turpentine. If it dries a little too quick, or is a little too dense in color, add a little oil in the place of the turpentine. When you are quite sure the graining color is ready for use, proceed with the work of graining; by first coating in a small portion of the work, using a brush somewhat worn to apply the color; such as a three and a half inch flat wall brush, or a six naught round paint brush, most completely washed in turpen-

tine or coal oil—(the latter the cheapest for this purpose)—to free it from any paint that might be in it. Coat the panel of a door, and put the figure work, combing, &c., on it; then proceed to coat the balance of the door, and to finish it. In this way you can do the work without any of it getting too dry. Though, after you have become more experienced in the work, you can coat the whole door, and then do the figure work before the graining color begins to set. Always remember to use just as much of the graining color over the ground color, to produce, as near as possible, the exact shade of the natural wood. This will require but a small amount of the stain. Do not dip the brush in the stain like you would in a white lead paint, but just touch the end of the brush in the stain.

You should look for growths and figures of nice design in the natural wood and copy them on paper with a pencil, and draw them many times until you have them fixed in the mind, that when you go to do a piece of graining you will not lack for designs.

After you have coated a panel with the graining color, being very particular to apply just stain enough to make it as near the same shade of the natural oak as possible, then, with a piece of old and soft muslin folded over two or three times to give it some body, so it will pick up the color as you run over the stain, to wipe out and make the growth. The thumb nail should be cut short and smooth, to avoid making too fine streaks when using the rag over the thumb. Place the rag in the right hand and over the nail of the thumb. With the left hand the ends of the rag

are held away from the panel, and this also serves to steady and guide the right hand.



POSITION OF RAG AND HANDS.

Starting from the top we wipe out the figure, putting in its coarsest markings and broadest lights nearest the right hand edge of the panel as it would be in reality. From this side the figure is imitated in varying degrees of coarseness, until its markings, gradually getting smaller and closer, are intermingled with

the coarse combing of the other side. I would attempt to picture the figure in its varying details, but nature alone should be the teacher. He who would be an artist in his profession, will do well to sketch his designs from the real figure as nature has designed them. While you are spending considerable time in the acquiring of the different figures, you should not forget that there are other points of importance to be mastered; such as the peculiar manner in which the figure is wiped out.

The beginner, in most all instances, in trying to imitate a real oak panel, has not studied the manner by which he should manipulate the rag and thumb. Invariably he commences by wiping, in imitated form, with either straight smooth lines, or with smooth circles. You should not be afraid of making too light markings and placing them in close proximity with each other. You will observe that the lines or markings in the real figure has a some what jagged appearance. This is the particular feature of the work I wish to talk upon. You remember the fellow who took three steps ahead and slipped back one. Simply stated, this is just about what you do in graining. You shove the thumb foreward in a line about one half or three fourths of an inch, then you slip back some distance, repeating the operation until you have wiped out the whole figure. Though I do not wish you to understand that there should be no straight, plain lines. The markings shown in the illustrations on pages 52 and 56 will give an idea of the meaning I wish to express.

In the real growth or heart figure we notice that it has a blazed effect; that is, it spreads from the cen-

ter of the growth in fan design to the outer edge. This you can imitate by using the denticulated or disjointed movement, diverging (not in parallel lines) as you work outwards; however, maintaining clean and neat wiping out. To more perfectly imitate this effect we will employ the use of the blender, by placing it on the figure at the center of the growth and lightly drawing it lengthwise to the end of the panel, replacing it each time near the center and diverging toward the corner of the panel until the repeated operation will cause you to brush in a course diagonally across the panel. You should not place the brush at the center each time, for once or twice going over the figure will blend it out nicely. As you see the work is being blended out, you may set the blender on a little farther from the center thereby avoiding the destroying of the center of the design.

There is a small space of the plain staining left on each side of a growth after it is wiped out on a lock rail; or, on small pieces it will occur on one edge, as the growth is usually made on one side of the piece. To make this look harmonious and pleasing to the eye, just crumple your rag in a bunch in the hand and place it on the stain at the edge of the figure just made. Now run along over the stain, wiping off a portion of the color, pressing just a little the hardest next to the growth and letting the rag run lightly over the color as it nears the edge. This will wipe the color off next to the growth to about the same shade as the growth you have just made, and will blend off into the darker shade at the edge. Now take the same brush you have used to apply the graining color and wipe it out well (a badger blender may be used,) if you so desire, but the graining brush is just as good free from any of the color; then brush it over the figure you have made on the lock rail with the grain, which will blend it out very nice and soft. Be careful

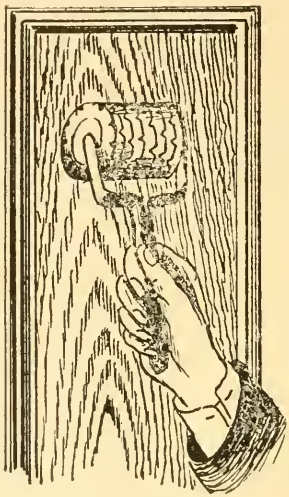
to not rub too hard or you will destroy the figure. Brush both ways if the work requires. Now take a sheet of No. 1 sandpaper and place it with the sand side to the paint, one edge at the joint of the end of the lock rail and brush up and down over the edge of the paper. This will take out all marks which were run across the side rail of the door when graining the lock rail. You can perform this at the end of any grained piece where the end comes against the edge of another piece which makes it look like a natural wood joint.

You should get a set of the best steel graining combs; and, if you wish to finish the work in quarter-sawed oak, the work should be combed out nicely with either the medium or coarse combs; then, with the rag folded over the thumb, work in the quarters as natural as possible.

I hope that the above remarks will convey to the beginner an idea how the work is done, and that with practice, you will be able to turn out very good work. To become a good grainer is a great as well as profitable accomplishment. Trusting that you understand this far, we will proceed with the next step, which is the checking of all growths; and, if you like, many other places; such as quarter-designed pieces and some of the plain pieces. This particular part of the work is quite simple to perform, but gives to the work, if well executed, a likeness to the natural wood that makes it hard for the connoisseur to detect.

CHECKING.—This is done by taking a check-roller (which can be bought at a painter's supply

house); a board twelve or fifteen inches long, and say six or eight inches wide, and the next day after the graining has been finished or is dry, take the brush with which you applied the graining, and with the graining color well stirred up, coat the board with a liberal amount of the color. Now run the check-roller over the color on the board, then lengthwise over the graining,



CHECK-ROLLER.

repeating the operation until the entire grained piece has little dots covering its surface (as many as look to be like a natural piece of oak—this you will know by observation.) Then wipe the brush out well and gently brush in the same direction that the roller had been run, blending the dots into little fine streaks

about one-half inch long. Go over all the work that requires this, and when perfectly dry, it is ready for varnishing.

CHAPTER XII.

Grounds and Graining Color.

Having treated the subject of oak graining in its several different phases, I feel that a few remarks relative to the foundation for graining and the graining color may be of some benefit to the reader.

Upon the respective quantities of linseed oil and turpentine used in the mixing of the grounding paint, depends entirely the amount of gloss we shall obtain for the ground color. The determination of the respective quantities to be used must, to a considerable extent, be left to the judgement of the grainer; as, regarding such matter, it would be difficult to state a rule to which all authorities would agree. A popular proportion is: Three parts boiled linseed oil to one of turpentine In the judgement of others this rule is directly reversed; while still others, of equal proficiency, use the two vehicles in equal proportion. The preferment of the grainer, governed of course by conditions and circumstances, usually determines this matter.

The writer personally prefers the latter mixture, believing that the amount of gloss so obtained affords a better surface for the subsequent work. This mixture makes a surface of medium gloss and promotes the amalgamation of the graining color with the

ground; at the same time making easy the wiping out of the lights of the figure. Clean and easy wiping out is impossible on a dead or flatting paint; and a too glossy surface is also unsuitable.

I wish to mention that the color of the ground employed depends altogether on the wood we intend to imitate. For light oak the ground should be lighter than for antique; the colors mentioned in the preceding chapter may be used by regulating the proportions according to the color desired.

Before going further into this subject, let us understand alike what is meant by the term "ground." In the natural order of things, this word embodies both surface and color, each of which is a factor of importance with respect to the art of successful wood imitation.

Closely related to the "ground" color is its companion, the "graining" color. Two never absent qualities should distinguish the latter, to wit: First, that transparency of pigment which affords the best color imitation of the genuine article, following its superimposition; and second, freedom and ease in application.

The dual character of the color effect that is most desirable, makes this phase of the subject difficult of comprehension; and yet its mastery is imperative to those who would attain proficiency in this particular branch of the art. Success in this, as well as in all other works of art, is contingent upon close application, and can only be expected to follow a considerable experience.

In the treatment of this subject I have aimed to lay before the reader those features of the work which are deemed most vitally to effect the ultimate result, and in connection with the remarks already offered would lay especial stress upon the preparation of the surface, which it can not be too emphatically insisted, must be smooth, even and free from all brush markings.

The young man contemplating the learning of painting, will do well to acquire a knowledge of graining. The time is coming not far in the future, when the art of graining will be in demand. Oak finish having become so popular, and the great demand for the commodity, will soon place it beyond the reach of the majority of people. Therefore, an artist of graining will have to supply such a want with an imitation. Then the truer to nature, your handiwork, the greater in demand your services will be.

CHAPTER XIII.

Combination of Colors for Ceilings and Side Walls in Distemper Colors.

In the five combinations that follow, the student may mix the darker or wall color first, making some more than will be required to paint the walls. Put this extra amount of wall color into another bucket and lighten it with white until you have matched the ceiling color of the sample specimen. For the striping and stenciling, make the color either a little darker or lighter, just as you may wish, coloring it with the same pigments.

CEILING. WALL.

AMBER COMBINATION.

White, Yellow Ochre and Burnt Sienna.

CEILING. WALL.

DRAB COMBINATION.

White, Yellow Ochre, Lamp Black and Light Red; White and Raw or Burnt Umber.

CEILING. WALL.

TERRA-COTTA COMBINATION.

White, Burnt Sienna, and just a touch of Burnt Umber.

CEILING. WALL.

GREEN COMBINATION.

White, Yellow Ochre, Prussian Blue.

CEILING. WALL.

BLUE COMBINATION.

White, Prussian Blue and Lamp Black.

CHAPTER XIV.

Rules for Making Sixty-one Different Colors.

BROWN—Take black and vermilion, three to one.

BROWN, AGAIN—Take black and Venitian red, one to one.

GREEN—Take chrome yellow and Prussian blue, one to one; for lighter color, less blue. To make it a cooler green, add a little white.

PURPLE—Take Prussian blue and carmine two to one.

CRIMSON—Take carmine and drop black, eight to one.

LAVENDAR—Take white, Prussian blue and English vermilion, eight, three, one.

BUFF—Take white, yellow and raw sienna, five, two, one.

STRAW—Take white and yellow, one to one.

FIRE—Take yellow and vermilion, two to one.

GOLD—Take yellow and white, five to one.

SILVER—Take white and black, ten to one.

MARBLE—Take white and Prussian blue, two to one.

CLEAR WHITE—Take white and Prussian blue, ten to one.

DEEP GRFEN—Take chrome green and Prussian

blue, three to one.

LIGHT GREEN—Take green and chrome yellow, three to one.

FLESH COLOR—Take white, yellow and Chinese vermilion, fifty, six, one.

WATER, RIVER—Take white and Prussian blue, six to one.

WATER, OCEAN—Take white, Prussian blue and yellow, six, two, one.

SKY, NOONDAY—Take white and Prussian blue, twenty-five to one.

SKY, SUNSET—Take white, Prussian blue and vermilion, two, two, one.

DEEP BLUE—Take blue and black, three to one.

BRONZE GREEN—Take yellow and black, one to one.

VERY DEEP GREEN—Take yellow, blue and black, two, three, one.

BRIGHT RED—Take white, vermilion and carmine, one, one, one.

LIPS AND CHEEKS—White and vermilion, one to one.

WHITE OF EYES—Take white and Prussian blue, ten to one.

BLACK HAIR—Take black and vermilion, two to one.

BROWN HAIR—Take black, yellow and vermilion, two, one, one.

GOLDEN HAIR—Take black, yellow and white, one, five, three.

AUBURN HAIR—Take black and red, one to two.

GRAY HAIR—Take black and white, one to six.

BLUE EYES—Take blue and white, one to one.

GRAY EYES—Take black and white, one to five.

BROWN EYES—Take black and yellow, one to three.

HAZEL EYES—Take black, yellow and vermilion, one, four, one.

TABLE FOR MIXING PAINTS—In making the following named colors, mix as they come in order, the predominating color being first; second, next, third, next; and so on:

PEARL—White, black and blue.

FRENCH GREY—White and black.

GREY STONE—White, yellow and black.

LIME STONE—White, yellow ochre, black and red.

ORANGE—Yellow and vermilion.

OLIVE—Yellow, blue, black and white. More white for lighter, or more black for darker.

CHESTNUT—Red, black and yellow.

FAWN—Yellow and red.

CHOCOLATE—Raw umber, red and black.

DRAB—White, raw and burnt umber; or, white, yellow ochre, red and black.

BRONZE-GREEN—Chrome green, black and yellow; or, black and yellow; or, yellow, black and green.

PEA GREEN—White and chrome green.

ROSE—White, madder and crimson lake.

COPPER—Red, yellow and black.

LEMON—White and yellow.

SNUFF—Yellow and Vandyke brown.

CLARET—Red, burnt umber and black.

DOVE—White, vermilion, blue and yellow.

PINK—White, vermilion and lake; or, white and vermilion; or, white and Indian red; or white and burnt sienna.

CREAM—White and orange yellow.

SALMON—White, yellow, raw umber and red.

PEACH BLOSSOM—White, red, blue and yellow.

LILAC—Mix white with violet.

CHANGEABLE—Use red and green, and lighten with white Use more or less, to give the shades desired.

AMBER—Use white, yellow ochre and burnt sienna.

TERRA COTTA—White, burnt sienna and burnt umber.

MUSTARD— White, Raw sienna and yellow.

CHAPTER XV.

How to Paint a Carriage.

PAINTING THE RUNNING GEAR.

PRIMING.—The wood work for the running gear of a carriage should be primed soon after it has been made. The best pigment for this purpose is dry Venitian red, mixed with raw linseed oil and turpentine, about 9 to 1. This primer should be quite thin, and well rubbed into the wood, using a bristle brush of medium size; say a four naught brush, somewhat worn.

FIRST COAT.—After the gear has been ironed off, take it into the paint shop, and thoroughly clean all grease and oil from it with a rag saturated with gasoline or turpentine. I prefer the gasoline, as it does its work quickly and efficiently. The turpentine is very hard on the constitution of the painter, and should never be used to wash the hands with; nor be brought in contact with the body, if it can be avoided. After the grease is all cleaned off, take a piece of number ½ sandpaper. The folding of the sandpaper, to make it into convenient sizes may be done in this way: Take the sheet of paper and lay it, sand side down, now fold the paper twice, making three divisions of equal size, folding the paper the shortest way. Now, with the

putty knife, cut it at the creases by running between the two pieces, after the three pieces are cut, take each piece and fold it over twice, which makes a piece 3x4 inches square. Sandpaper the irons and wood work perfectly smooth. Be very particular as to this sandpapering, and also at all other times you may be called on to do this kind of work, in the progress of the painting. Be most careful next to the clips, the ends of the spokes, etc. If you sandpaper the hard places well, there will be no trouble about your getting the easy places; such as the middle of the spokes and the plain surface between the clips. After through sandpapering, dust the gear and wheels down, getting all dust and sand off.

Now we are ready to mix the first coat and to apply it. It is mixed as follows: Take white lead and color it with lamp black, to a dark lead color. Thin this to the proper consistency with three-fourths raw linseed oil and one-fourth turpentine, with a little good coach japan to dry it.

To apply the above paint you should use a one and a half inch camels' hair brush. By the use of this kind of a brush the paint can be laid on without any brush markings. It is necessary that the student exercise the greatest care in the laying on this coat—and also the coats to follow. Should any brush markings occur in this, or the coats to follow, they will be bold and distinct when the work is finished. They can not be sanded out; so the proper thing to do is not to give them an existence. The more careful you are with these little things, the nearer you will reach perfection

when the work is completed. Be sure to cover all parts with this coat, underneath as well as on top. Let this coat stand until thoroughly dry. Not just a surface dry; but through and through. There is a great difference in surface dried paint and being dried through, and hard. The best test to know if the paint is hard, is to scrape the finger nail over the surface; and, if the paint scrapes up and under the nail, the work will have to stand longer. If no particles of the paint can be scraped up, then the work is ready to undergo the next step.

PUTTYING.—This is a part of the work of no small importance. To putty a gear correctly requires considerable tact, as the character of the finish depends largely on how well you have performed the work now in question. We will first consider the preparation of the putty, before going any farther. I have given a description of quick drying putty, in the talk on wall work; but such a putty will not do for carriage work. The putty that we wish to make is composed of good lump whiting, dry white lead and rubbing varnish; or, whiting, dry white lead and equal parts rubbing varnish and coach japan, made to the consistency of putty, then pounded with a hammer, until free from lumps or grit. The latter mixture is only used when you have hurried work on hand. After the putty is made, keep it in a cup and covered with water.

The next step will be the application of the putty to the work, supposing that the second coat is now ready to receive it. The prime feature in puttying is to make out as perfect as possible; and to do this, you must

fill all holes, bumped and bruised places on the surface, the cracks between the axel and the axel bed—which is the wood on top of the axel—and to glaze the entire surface of the axel beds, the head block and spring bars, filling up all the pores of the wood, and glazing any parts of the iron that may need it. You should use a medium elastic putty knife for the puttying; and do not pile the putty up in piles or leave any on the surface. Put the putty in the holes, or cracks, and none on the surface. When doing the glazing, put it on just as smoothly as possible; and if you wish, you can rub a piece of linen rag over the glazed piece before the putty dries, which will make it smooth. The student must keep it in mind, that a great amount of sandpapering will be saved if he will only be particular about the puttying. This putty will dry hard in from eight to ten hours, after which the work is ready to sandpaper. The sandpapering must de done with care, using No. o paper. You must not cut through the first coat of paint while doing the sandpapering; for this being the only coat of paint, and it being cut away while sandpapering, would cause the coats mixed with out oil to find a resting place on the bare wood, and would soon crack off.

With the gear, wheels and accessories thoroughly papered and dusted down, we are ready for the second coat of paiut.

SECOND COAT. The first thing we will consider will be the mixing of the paint, for the second and third coats.

Take a sufficient amount of the stiff white lead

out of the keg to make paint enough to coat the gearing twice; allowing the oil which is on top of the lead (in the keg) to drip off of the lead you are just taking out; or it should be elutriated with turpentine. This paint is to be a flat preparation; for the purpose of making an easy surface to sandpaper. For, the reason we do not wish any more oil in the preparation for second and third coats than is used in grinding it, is because the oil paint clogs up the paper and does not paper down to a hard and even surface. If the lead is quite stiff, which is all the better, add a little turpentine, not enough to thin it, but just to soften a little. Now put in a sufficient quantity of dry lamp black to make the mixture a decided dark lead color. Do not be afraid of getting too dark, if you intend making the gearing black; but if the gear is to be colored red, green, or some kindred color, the paint in progress of mixing, need not be so dark. Judging the student grasps the importance of this color theory, we will return to the mixing of the paint. Now that the lamp black is in, we will proceed to finish. While the pigment is in this semi-state of consistency (consistency means thickness, or density) add a half teaspoonful of good coach japan to a quart of the prepared paint, and beat, or stir it thoroughly; after which you can thin it with turpentine to the proper consistency for use, about like thin cream; or thin enough to flow out easily under the brush.

This mixture should be applied with a 1½ inch camel's hair brush, thus securing an even coating and freedom from brush markings. This will dry fast, and

for this reason it must be manipulated in such a manner that any part coated with it may have the entire surface coated before the paint sets.

Let the reader be a close observer while one practised in the use of such paint proceeds to coat the gear. The first thing I will do will be to procure a board long enough, when set up endwise under the axel, to raise the wheel two or three inches off the floor. Now I place my cup of paint, on a four legged stool, two feet high, made for this purpose; and place the stool in front of the wheel, in a position convenient for working. Now I stand with my left side to the front, and at the rim of the wheel, with the left hand holding the rim. I coat the sides of two spokes, including the face; then with an alert motion, the wheel is turned one quarter way from me, and the other sides of the two spokes are coated. The wheel is then turned back the quarter turn to its first position. Now the brush is charged with more of the paint; and, taking the brush in the left hand, while standing in the same place, I reach over and behind the wheel and coat the back edge of the two spokes. I repeat this operation until all the spokes are coated and then I coat the hub, front and back. While yet standing in the same place I squat down, and coat the inner edge of the rim between the spokes. Then rising to my feet, in a half erect position, I coat the sides of the rim. You have observed that I have not changed my position since first commencing to paint the wheel. The other wheels are painted in the same way. I will now direct my attention to the gearing, which is simple enough. I

place the paint and stool in front of the gear, to the right. I first coat the spring-bar, then the spring and head block. After this I commence at the right end of the axle and coat it on both sides as I advance to the opposite end. The rear and reach are painted in the same way.

Let this second coat dry through and through, which will take from twenty-four to thirty-six hours.

Now look all over the gearing, and where ever you find any holes not level, or the putty sunken, re-putty them, as well as all other places that have been overlooked during the first puttying. When this putty is dry, sandpaper the gear well, using No. ½ paper, after which dust the work down. and it is ready for the third coat.

The third coat is applied in the same manner as the second; and the instructions regarding the manipulating of the same will be observed for the application of this coating.

This third and last coat of lead, must stand until the paint is dry and hard; so that when you paper it, it will cut down dry, and leave the surface smooth hard and glasslike. For the benefit of the beginner, I wish to impress upon his mind the importance of the sandpapering of this coat of paint, for herein lies the foundation for the finish. This part of the work, by many painters, is looked upon as insignificant; and THERE is where most failures are made as regarding a level finish. There are three very important points to be considered when painting a carriage. Namely: the first coat of lead, applied after the job has arrived in the paint shop. This is to make the foundation for

durability. The second is the preparation of a smooth and level foundation for the final finish. And thirdly, the finishing, or last coat, which is the same to the under coats of paint as the roof is to a house. Believing the student now understands the great importance of these things, we will advance another step farther; but before doing so, let me once more caution the beginner, to be extremely careful when sandpapering any of the coats of paint (except the priming coat), not to cut through the paint to the wood.

COLORING. If your desire is to make the gearing black, take ivory drop black, ground in japan. Thin with turpentine to the proper consistency for use, which must be rather thin. To this add three or four drops of raw linseed oil, to give it just an eggshell gloss. To know when you have oil enough to produce this test it by placing a drop on the thumb nail, and blow it with the breath, when it will dry immediately thereby showing the amount of gloss. Use a camel's hair, coloring brush 1½ inch wide to apply the coloring and follow the instructions given for manipulating the second and third coats. This coloring will require from five to six hours to dry. Now we are ready to commence the color varnishing.

COLOR VARNISHING.—You can buy a black varnish for this purpose, but for this job let us make it. The student should be independent, so far as possible, and be able to make the greatest number of mixtures from the materials on hand.

To make black varnish enough to coat the running gear, thills, etc., take one pint of good medium

drying, rubbing varnish, and put as much of the drop black (as you have had left from coloring the gear,) into the rubbing varnish as will make it a jet black. Then proceed to varnish the gear with this, observing the directions given for second coating. This method must be employed for the reason that the black varnish will set quickly. By following the directions laid down you will avoid any laps in the varnish, as it will be flowed on small places at a time, thereby insuring nice even coating. When the color varnish is dry and hard, you will go over the entire surface of the gearing with a bunch of Georgia moss. By taking it in the hand and rubbing the surface of the varnish until you have destroyed the gloss, you will help to make the surface smoother, and also to prevent the subsequent coat of varnish from "cessing" or creeping off. The gloss must be removed from all varnish before attempting to apply another coat, as there is but little affinity between the two coats. If the gloss is allowed to remain, the newly applied varnish will "cess," or run off.

I might say here, while treating on this subject, and for the benefit of those who do not know that, should the varnish "cess," or run off, after the gear has been mossed, you can take a small sponge saturated with turpentine and run over the surface, and thus keep the varnish from creeping. Now dust the gearing down in the best manner possible. It will then be ready for striping, and afterward, to receive the final coat of varnish; or, if you desire to give the work an extra fine finish, you should give the gear a coat of clear rubbing varnish before the final finish. This you

will apply in the same way you did the color varnish. It will take this varnish from twenty-four to forty-eight hours to harden fit to pumice.

The length of time it takes for the varnish to dry depends on the kind of varnish. The number of hours is given on the can. When the proper length of time has elapsed for the varnish to harden, take a piece of rubbing felt, wet with water, and dip in pulverized pumice stone. Now rub the surface of the gearing with the felt, first wetting it with a damp sponge (rubbing a wheel at a time). Rub all specks from the surface, thereby leaving it with a dead finish when done. Wash the pumice stone off as completely as possible before it has dried to any part of the surface, and wipe the gear off with a chamois skin wrung out of clean water.

Go over one wheel at a time, finishing as you go.

It will also be well to take half of the gearing at a time. Now after you have gone over all the gearing in this way, wash the sponge and chamois skin out, free from all pumice stone, and with clean water and sponge, wash the gear all over again, to free it from any pumice stone that may have been left on in the first washing. You should use a No. 5. sash tool to wash out around the clips and between the spokes and places you cannot reach with the sponge. Do not be afraid to use plenty of water. After through washing, if you are sure you have all the pumice stone removed, you may wring the chamois skin out and wipe the work dry. Now the work is ready for striping, if you desire to do so. If not you can prepare for the

finishing coat.

FINISHING COAT.—Buy the best elastic gear-varnish on the market, the best is none to good. Use about one quart to varnish the gearing.

Now reader, if you will follow me for a while, I think you will understand the manipulating of the finishing. We will go to the varnish room and sweep it out perfectly clean allowing a draught to pass through the room while doing so to take the dust out. After the sweeping is done we will take a duster and dust down the walls, and any places that the dust could have lodged; leaving the doors and windows to remain open until all the dust has been wafted from the room. Now we will take a bucket of water and sprinkle the room down; using a sponge for this purpose, sprinkling the floor, and any place the dust is likely to be; but will not make it too wet. We now close the windows and door, and while the room is drying out a little, we will spend some time in getting the gear ready to take into the varnish room. This will be to dust the gear down, by commencing with the wheels, dusting one at a time, until they are free from dust. Then we will dust the spring bars, springs, axles, etc. This being completed, we will run it into the varnish room at once. We will take a two inch flat varnish brush, kept for this purpose, and then we will put about two drops of varnish on the palm of the hand and rub the ends of the bristles of the brush in it to make the bristles just a little sticky. Do not use more than two or three drops of varnish for this purpose; or you will get too much on the brush, which will spoil it, and might

distribute little particles of the varnish on the work, thereby making the surface rough. With the brush prepared thus, we will go all over the entire gear, brushing the surface just lightly with the ends of the bristles, with a leisurely movement to give the varnish time to pick up any little particles of dust there may be left on the surface. When we have finished this we are ready to do the varnishing.

THE VARNISHING.—We will first consider the brush: There are many different kinds that can be used for this purpose. The brush preferred by the writer is a flat chiselled varnish brush; brass bound; Extra Select, Black Chinese Bristles, Cement Set, and short round stocky handle. Double thick, one inch and a half wide, or two inches if you prefer. The brush, if a new one, we will wash out in a clean cup with some turpentine, to remove all dust and grit. New brushes are much preferred after they have been in use a few times. The taking care of the brush we will consider a little farther on.

A leaded bottom varnish cup, quart size, is a very convenient article. This cup will stand on its own base, saving the student the trouble of taking hold of the cup each time you wipe the varnish out of the brush. I believe you can see the utility of a cup of this description.

The varnish requisite for such a finish is one which will combine brilliancy and durability.

Now, student, just watch the method and movements of the finisher, while he is applying the finishing coat. We now take up the work where we left off,

that is, the gear is in the varnish room and has received the final dusting off, as described in our talk just a moment ago. I fill the varnish cup about two thirds full of the gear varnish, then I place the cup on the paint stool.

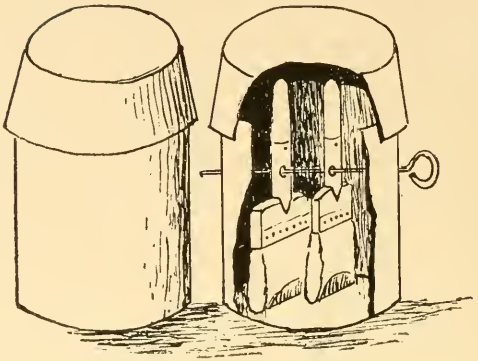
Not having heretofore mentioned that the gear should be placed on trestles, we will do so now. When the gear was first run in the varnish room, it should have been placed upon trestles; one under the front axle, and one under the rear, the wheels about three inches from the floor. Now I place the stool with the varnish cup in front of the left hand front wheel, about at the hub. I then step to the front of the wheel, with left side to rim, and take hold of the rim with the left hand. The method of coating now is much different from the previous instructions for second and third coats. Instead of coating two spokes at a time, and so on, we flow the varnish on the surface of the entire wheel, which requires accelerated movements. Now I varnish the one side of the spokes, then the other, then I change the brush into the left hand and coat the back of the spokes. After this I change the brush back into the right hand and then coat the hub. You see I coat the rim, coating the inside edge between the spokes and the out side face at the same time. Now I change the brush to the left hand and varnish the back of the rim. In so doing I stand in the same place and pay no attention how the varnish looks, only wishing to cover the entire surface with a good heavy coat as quickly as possible. The wheel being now coated all over, I wipe

the brush out quickly and commence to wipe up the superfluous amount of varnish and to brush it out and distribute it over the surface evenly. This I do by commencing with the side of the spokes I first coated, setting the brush on the spoke at the end next to the hub, and brushing outwards to within five or six inches of the rim, allowing the brush to gradually run lighter until removed. I then set it on again at the rim, and brush toward the hub; over lapping the last brushing a few inches; always allowing the brush to leave the spoke with a very light and airy touch. Repeat this operation on each spoke (both sides.) Wipe the brush on the edge of the cup when it has picked up varnish enough to fill it; though you should not aim to wipe up any more of the varnish than the brush will pick up in lightly brushing over the surface. I go over the rim and hub in the same manner. This wiping off and brushing out must be done in a very quick way.

Now that the wheel is varnished, and finished, let it stand for two or three minutes, then turn it half way around. Let it stand this way for a few minutes when it may be turned another half turn; repeating this until you are quite sure the varnish is set sufficiently that it will not sag, or run down on any part of the wheel. The varnish is flowed on so heavy that if you do not turn the wheel, first one side up and then the other, until the varnish is set sufficiently, it would be sure to sag and to ruin the work. You may keep on varnishing another wheel while you are looking after the wheel just finished.

The wheels being all varnished, and safely out of danger of the varnish running or sagging, we will now varnish the gear part. As this can not be turned up and down, and must stand in the same position, I am sure the student sees at once that he can not flow as much varnish on it as he has on the wheels. We now flow the varnish on the front half and wipe it out nicely, just the same as we did the wheels. Then the rear half is done in the same manner. With the completion of this the gear is finished, and after you have seen that everything is all right, leave the room, taking all tools and material out with you. Close the room and allow no one to enter until the varnish is dry and free from dust, which will be about twenty-four hours later, depending on the nature of the varnish used.

THE TAKING CARE OF THE BRUSHES.—You should have a brush-safe for keeping the varnish brushes in. This may be made by having two cans, one just enough larger than the other to admit of its slipping over the other about one-half inch. The cans must be high enough to overreach the length of the brush. Make a hole in the handle of the brush large enough to run a wire through and about two and a half or three inches from the ends of the bristles, in the most convenient place. Provide some means of supporting the wire in the lower can, such as holes punched in the side of the can, and run the wire through them.



BRUSH-SAFE.

Put two-thirds raw linseed oil and one-third turpentine in the can until you have plenty to cover the hairs of the brush when strung on the wire. After leaving the varnish room, pour what little varnish remains in the varnish cup into a can and mark it "Slush." Never pour it back into the can of good varnish, because there will be more or less sediment in it after working out of it. This "Slush" varnish may be used for some work requiring a cheaper finish; or can be used in the making of black enamel paint. After the varnish cup has been drained of the varnish, put some turpentine in it and wash the varnish out of the brushes; and at the same time wash the cup clean of varnish on the inside; but do not rub the brushes over the outside, for fear of coming in contact with some grit or dirt. After the cup is washed, and brushes are clean, pour

the turpentine out and turn cup upside down to drain. Then place the brushes in the brush safe, and on the wire, and slip the upper can over the lower can and set away until needed again.

CHAPTER XVI.

Hints on Glazing Colors.

In the foregoing description of coloring a gearing we have spoken only of black. The following may prove advantageous, should you desire to make the gearing some other color.

FOR A DULL RED use Indian, Tuscan, or Royal red, ground in japan. (All colors for coloring in carriage work must be ground in japan.) Mix ready for use in the same way as for drop black.

WINE COLOR.—This particular color is secured by superimposing a transparent color on an opaque color, thereby combining the color effect of the two colors, to produce the desired color. This may be done in this manner: Make a ground color of Indian red, mixed the same as drop black, only using a few drops more of raw linseed oil to make it a good eggshell gloss. Coat the gearing with this just in the same manner as you did with the black. Now take carmine and mash it fine; put it into the paint mill and mix stiff with rubbing varnish. Add a little turpentine, after which it is ready for grinding. Grind through the mill with mill set quite close. After it is ground, thin with turpentine, with the addition of one or two drops of raw linseed oil. The carmine, or glazing color, must be

thin so that when flowed over the ground color it allows the ground color to show through, thereby combining the effect of both colors. Now you are ready to proceed with the glazing. To use the glazing color, or carmine, successfully, you can only coat a small surface at a time; and must flow the glazing color on so as to insure an even distribution of the color. To glaze over an opaque ground and secure an even distribution of color without streaks, spots, light or dark places, is the most difficult part of the work. Coat the entire gear and its accessories with the above, using a camels' hair brush one and a half inches wide and of good thickness. When this glazing coat is thoroughly dry, color-varnish it with some rubbing varnish which has been colored by pouring some of the carmine you had left from the glazing into the varnish. Then varnish the gear in just the same way as per instructions on black color varnishing.

You can use diffent grounds to glaze over, such as English vermilion, chrome yellow, or white, though the brighter the ground color, the more difficult it will be to get an even coating of the glazing color. However, the lighter the ground the purer the color of the glazing.

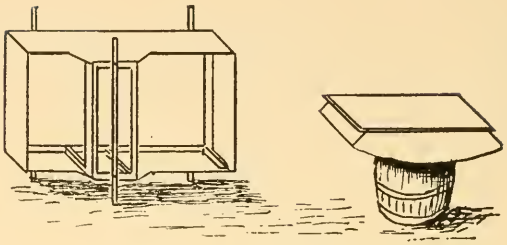
To reach the acme of perfection in the superimposing of a transparent color on an opaque color, requires much practice. But colors obtained through the glazing of one over the other are much more durable than those secured by adding a little white with carmine or crimson lake. For cheaper work, crimson lake may be used instead of carmine. The different

variations of color to be made by glazing one over the other are as great as the mind wishes to imagine. Many very beautiful colors, and colors not obtainable in any other way, are produced by the laying of transparent pigments over an opaque; such as French ultramarine blue over raw sienna and raw umber; rose madder over Indian red; and so on.

CHAPTER XVII.

Painting the Carriage Body.

The first thing we are called upon to do in the course of painting the carriage body, after it arrives in the paint room from the wood shop, is to prime it. This is done by making a priming paint of white lead, colored to a medium lead color with lamp black, and thinned with raw linseed oil, a little turpentine and a small quantity of coach japan. This priming coat should not be too heavy, and when applied, should use just enough of the paint to give the surface a fair coat; being very sure to thoroughly rub the paint in the grain of the wood, coating the entire body, inside and out. However, before commencing the coating of the body, and for the convenience in handling it during the subsequent treatment, we will get three sticks, eight or ten inches longer than the body is wide and fasten them securely thereto with screws, one on the top, and the other two on the bottom; allowing them to extend an equal distance on each side, thus forming legs on which the carriage body may stand while working at it.



POSITION OF CARRIAGE BODY.

After the priming is DRY, we putty all the plugs, nail holes, and all places needing putty; using the quick drying putty spoken of in the chapter on painting the gearing. The body must stand until this putty is dry through and through. Now we are ready for the first coat of filler, which is made of Reno's French umber and one-third each of rubbing varnish, coach japan and turpentine; using enough of the umber in the vehicle to make a paint of about the consistency of cream.—This filler can be used a little heavier than ordinary paint. Apply four or five coats, according to condition and kind of job you wish to make. Putty after each coat of filler, until there are no traces of the plugs or nail holes.

There is no logical reason why the roughstuff process does not amount to much. If so, I am not able to see it. In the well ordered shop, and by the skilled, conscientious painter, a great deal of pains are taken with the mixing, applying and rubbing out the roughstuff, to the end that a fine finish may be obtained. From my point of view, the application of the filler to the surface is one of the important steps in the

successful building of a roughstuff foundation. If the pigment is put on the surface in a loose-jointed, careless way, thick and thin in spots, and not brushed out properly, the ever prevalent result will be that in rubbing out, the workman will rub through to the lead coat, and, quite likely, to the wood, in places.

A good finish can not be obtained over such a surface. The imperfect mixing of the roughstuff may be responsible for some such sloppy work. The filler should be thinned down so that it can be put on and spread out without leaving brush marks. At the same time it should not be used too thin. One can easily drown the pigment with turpentine, making it a wash with no body; lacking substance, or surfacing quality. The filler required, and that should be used, is one with enough body so that, with four or five coats, a sufficient depth is obtained to secure a good surface without rubbing off all the roughstuff. Factories are recognizing the increased demand for better painting; therefore the painter should give special attention to the mixing and application of the roughstuff, as well as to other branches of the work. The filler should be applied with the object of securing a smooth surface, to the end that the minimum amount of rubbing will develop the maximum degree of levelness and smoothness.

After you have put on as many coats of filler as you think necessary, make what is called a guide coat, by taking dry lamp black and mixing it with turpentine, with just a little japan to act as a binder. (Use just a small amount of japan—a few drops; too much

will make hard work to cut it off;) and only mix a small quantity. Make the guide coat thin, like water, and barely rub on enough to blacken the surface of the filler.

When the body has received all the coats of filler, and the guide coat, and has stood from six to eight hours, it is ready to cut down with the pumice stone. This is accomplished in the following manner: Procure a worn-out saw, a coarse, flat file, a sponge, a bucket of water and a lump of pumice stone. Now take the saw and cut the lump of pumice stone in the middle, making two pieces with one flat side on each piece. Place one end of the file in the water; also dip the lump of pumice stone in the water, and then rub it over the file to give it an even and smooth surface. This treatment of the stone should be repeated from time to time while rubbing the body, should any hard, or gritty spot appear on the surface of the stone, as this would scratch the surface of the body. Now place the body on its side, being careful not to bump any of the filler off in handling it. Wet the side of the body with the sponge, then commence rubbing the guide coat off with the flat side of the piece of pumice stone. Keep plenty of water on the side of the body, rubbing with long strokes, from one end of the body to the other, always rubbing with the grain of the wood—never crosswise. Go over the entire side with this large piece of stone until the side is quite smooth; but be careful not to rub through the filler to the wood; as it is difficult to fix such a place that it can not be seen. When you have gone over the entire

side with the large piece of stone, then take a small piece and rub all the places where the guide coat remains, such as uneven places where the large stone could not touch. Go over the side with the small piece until no guide coat is visible. Repeat this operation on all sides and panels, then wash the body clean, and set away to dry. If it is an extra fine carriage, you can rub the inside with the lump of pumice stone, though sandpapering will make a fairly good job for the inside of the box.

When the body is dry, which will be in about twenty-four hours after the rubbing is finished, take No.—o sandpaper and paper the entire exterior of the body. This will make the surface smooth and hard like glass. The inside of the body will need but two coats of filler and to be sandpapered with No. ½ paper.

COLORING.—After the body has been papered and dusted down, use drop black, ground in japan, and thinned with turpentine to proper consistency for use, with the addition of two or three drops of raw linseed oil. Use a camel's hair brush, two inches wide and of good thickness to apply the color. This will require two or three hours to dry, when it is ready to receive the color varnish. The color varnish is prepared in the same manner as for the gearing; and applied the same as varnishing. This color varnish will dry sufficiently to work over in about fifteen hours. Moss the color varnish off well, which serves to destroy the gloss and remove specks and so on. Now we will give the body a clear coat of rubbing varnish, one coat of the clear rubbing varnish being sufficient for most any

kind of work. When this coat is dry rub it down with pulverized pumice stone and water, removing all specks and bringing it to an even and perfect surface ready to receive the final coat of varnish. If you desire to do striping now is the time to do it. If not, we will make arrangements for varnishing the body.

VARNISHING.—The varnish room must be prepared with care. Sweep and dust the room perfectly clean. Sprinkle the room down with water, using a sponge to do the sprinkling. Wash the body with clean water, being sure to wash all the pumice stone off. Wipe off all the water with a chamois skin; then remove the body to the varnish room and close the door, allowing the room and body to remain so for an hour or more, giving the room opportunity to dry out some. The temperature of the room in the summer time can not be regulated very well; but it can and should be kept at about 80° in the winter.

Procure the best "Medium Drying Body Varnish" possible and blow the dust off of the top of the can before removing the cork.

Have a two inch, bear's hair varnish brush, of good thickness. Wash it out in clean turpentine —to remove all dust or particles of dirt there might be in the brush.

Now pour a tin cup about half full of the varnish, and prepare the dusting brush in the same manner as spoken of in the chapter on varnishing the gearing.

Now, go with me to the varnish room, figuratively. Before entering we will remove all superfluous clothing, and thoroughly dust off the clothing we have

retained. We will now enter the room, taking with us the brush, tin cup, varnish can and duster. The varnish, however, must not be poured out until after all arrangements for the final act have been completed. Even the TIN CUP and the BRUSH should be placed under cover to keep dust from them until ready for use.

Just stand over there and do not move about, for fear of starting some little particles of dust afloat. We can not be too careful in this particular. You will observe throughout the entire process of varnishing the body, the operator is very guarded in all his movements. The body is supposed to be standing on the three sticks, with the side horizontal.

With the duster prepared as spoken of before, I dust the entire body by drawing the duster across the surface of the body, with rather a slow motion, in order that the little particles of dust may adhere to the varnish on the duster.

All preparations being made, I will take the varnish cup in the left hand; and, with the varnish brush in the right, I take my position at the side of the body, facing the bottom of it. The brush being very liberally charged with the varnish, I commence flowing the varnish on the side of the body, with the grain of the wood, or the longest way. This must be flowed on rather quickly. I wipe my brush out now on the varnish cup, and then COURSE the varnish crosswise of the side of the body, going the entire length of the side. Now I wipe the brush out again and place it lightly on one end, and at one edge, and draw the brush very lightly from one end to the other; repeat-

ing the operation until the entire side has been brushed out. This completes the "finishing" of this one side.

You have noticed that, while I flowed a very heavy coat of varnish on the side, I was careful not to allow any of the varnish to run over and down the ends, or edges.

Now I turn the body over and varnish the other side in the same manner. Both sides being now finished, the next thing is to varnish the two ends. It is quite obvious that, with the two ends standing perpendicular, there can not be quite so much varnish flowed on them as on the sides. However, the varnish must first be applied to the end, brushing up and down; then I course the varnish crosswise finally finishing by lightly brushing up and down. While I am varnishing the seat, which is placed upside down on a barrel or box, I keep a watch of the two ends of the body; and should I notice a tendency in the varnish to run, I turn the body over with the other side up, causing the varnish to settle back to its place. The body now being finished you may retire with me from the room, taking with us the varnish can, cup and brush. We close the door, allowing no one to enter until the body is dry and safe from dust. This will require from twenty-four to thirty-six hours. The brush is cleaned and put in a varnish safe, as illustrated in a previous chapter. For this varnish brush should always be kept separate and used only for varnishing bodies.

In the summer time the flies should all be chased

out, or killed, when preparing the room for varnishing.

Always wash the oil out of the brush before commencing to varnish; for any oil in the brush will retard the drying of the varnish and have a tendency to make it "tackey."

CHAPTER XVIII.

Colors and Some of Their Chief Characters.

Hitherto the student has been carried through a simple course of instructions in outline of work, which naturally resolves itself in to a study of color, and which in turn, is the next point for consideration.

This is a wide and varied theme, into which it is not proposed to enter at very great length. Color, in so far as it is understood, or ought to be understood by the painter, is all that it is intended to explain. The higher branches of art are altogether beyond the scope of the present manual, and have been treated again and again by different writers on the subject. Most of these works, however, which are written by artists, and for artists, are of but little use to the student just beginning. The vehicles employed are in many cases the same; but the method of using them differs materially.

For this reason, in the pages which follow, the beaten track of writers on color is avoided. A practical acquaintance with the subject upon which we are treating, convinces us that much error may be obviated by setting down a few facts, regardless of what all preceeding expositors have advanced.

First, I prefer to deal with the colors themselves,

the vehicles employed in mixing them; and then to give a few hints regarding their use, and such other particulars as may seem to be called for, in order that the beginner may thoroughly comprehend the subject in all its bearings. It may be thought that the painter will at times require for his purpose every color that is manufactured and sold as an article of commerce; but this is by no means the case, as so many different hues, tints, and shades can be obtained by mixing two or more colors together. And, besides, there are many colors in favor with the artists, which for the purpose of the ordinary painter are altogether unnecessary. The following, however, are quite indispensible and should be amongst the painters' stock:

White Lead	Lake (Crimson or
Flake White	Scarlet.)
Zinc White	Rose Madder
Chrome Yellow	Ivory Black
Yellow Ochre	Lamp Black
Raw Sienna	Prussian Blue
Burnt Sienna	French Ultramarine
Indian Red	Emerald Green
Vermilion	Raw Umber

Burnt Umber.

Of these colors, some are transparent and others opaque. Some are mineral and others vegetable; and, consequently, a few words as to their nature, and the method of mixing and using them, seem to be called for before any reference is made to the laws of coloring.

WHITE LEAD, which is totally indispensible, is used in large quantities. It varies greatly in quality;

and, therefore, too much care cannot be bestowed in selecting it. That most generally used is procured ground in oil, and is of the consistency of thick paste. It improves by keeping; old white lead possessing greater body, or covering capacity, than that newly manufactured. The cheapest quality is decidedly the most expensive in the end, and should never form any part of the painters' stock. It is largely adulterated with sulphate of baryta. This may be detected by its insolubility in dilute nitric acid which will entirely dissolve pure white lead. Considering that white lead is the pigment most frequently mixed with colors to produce their tone, it is of the utmost importance that it should be of the best quality.

FLAKE WHITE ranks next in body or density to white lead, and is employed for highly finished work, in which a pure white is needed. It is generally used for the finishing coat; white lead being almost always used for the first painting; because, owing to the great body it possesses it covers the ground more effectually, while the flake white acts as the decorative coating.

ZINC WHITE is considered to be more durable than white lead or flake white. It is extremely pure, but has the disadvantage of possessing little body or covering power. Hence it is not held in such esteem by painters as it is by the artist, to whom this is no great detriment; because he can plaster on his color as thickly as he pleases; whereas the painter is necessarily limited to a few thin layers. However, it may be combined in mixture with white lead as previously spoken of in the chapter on "Exterior painting."

Thus the white lead makes the body, or opaqueness, and the zinc adds the durability.

For all ordinary painting, the best white lead will be found sufficient. It is only in very delicate or particular work that either flake white or zinc white need be had recourse to.

IVORY BLACK, which is the purest and deepest of the blacks, is made in forms resembling "drops;" and for that reason is sometimes called "drop black." It requires a good deal of careful grinding, being somewhat hard; and, unless it is ground very fine, it will spoil the work. It should be ground in japan and thinned with turpentine for all ordinary coating; and should never be used only over grounds prepared from white lead mixtures; though simply thinning with turpentine to a watery mixture, with a few drops of japan to bind it, will make a good ebony stain. For striping and decorative purposes, it may be used ground in oil, in collapsible tubes. Some writers advise grinding Ivory Black in turpentine, then adding gold size as a binder; but ground in japan, as formerly stated, is much preferred. Turpentine is a volatile oil, has no binding properties, and any color diluted with it alone, will be easily removed as if it were mixed with water, with out the addition of size or glue to bind it.

LAMP BLACK is the most pleasant working and the cheapest black used by the painter. It is not quite so intense as ivory black; but possesses more friendly and agreeable qualities. The best way to procure it, is to buy it ground in oil. It is free from grit, dense in color, and works easily under sable pencils. A

L. L. of C.

small quantity of japan drier should be added, to insure its drying with a unifomity of surface.

VERMILION.—There are many kinds of red manufactured for the use of the painter. These vary greatly, both in color and in body. The red most in use by the painter where a bright red is required, is "English Vermilion," which is intense and bright. There are several varieties of vermilion, or what is sold under that name. Being a heavy pigment, it is somewhat expensive. For this reason the inferior qualities of vermilion, or rather its imitations, commonly called mock colors, are frequently employed. These mock colors, are exceedingly transitory. When exposed to the action of the sun's rays, they turn, in a few months, to a sort of purple brown, and subsequently to a dull black. On this account they should be avoided on all work of any importance. And besides this disadvantage, these inferior vermilions do not mix or work well, having a tendency to mealiness, which prevents them from flowing from the brush freely.

When exposed to the sun the best will lose its brilliancy after a few months; and though this may be arrested for a short time by a coating of clear varnish, it will be certain to become dark in the long run. This is to be regretted, too, as vermilion is the only really intense bright red that possesses any body in itself. Notwithstanding this fugitive quality, however, it is a color which is greatly prized by the painter, and one which he can not well dispense with.

If English vermilion is secured in the dry state, and mixed stiff in a durable varnish and thinned for use

with turpentine, and subsequently varnished it will hold its color much longer than if mixed in oil. It can be procured ground in japan.

Vermilion, in a state of powder, may be tested by placing a dust of it on a piece of clean white paper, and crushing it with the thumb nail. If pure, it will not change its color by any amount of rubbing; but, if adulterated, it will become a deep chrome yellow, or assume the appearance of red lead, with which articles it is mixed in order to render cheaper. This accounts for the unstable quality of the inferior kinds of vermilion.

LAKE.—The other reds that have any pretensions to brilliancy are Geranium, Crimson, Scarlet Lake and Rose Madder. These are very pure, transparent colors; and, therefore, they are exceedingly devoid of body; and on that account are not easily manageable. Lake can only be used as a glaze—that is, as a transparent color, superimposed on some under color.

CARMINE is another exceedingly charming red, very much the same nature as lake. Owing to its great brilliancy it is much prized by flower painters.

INDIAN RED is a serviceable color, working very agreeably, and possessing very great body; one coat being sufficient to hide any ground color over which it may be laid. It is of a deep purple cast, and is very useful as a shade tint to vermilion; being darker in tone, and less brilliant. As a ground color it is in great repute. It will stand for a long time, retaining its color to the last. When used as a ground; or, as a last coat, and not to be varnished, it should be mixed with boiled linseed oil, with a small quantity of

drier; or it may be mixed with (supposing it to have been ground in japan) turpentine, with a few drops of raw linseed oil. When mixed in this way it dries very rapidly. It should be laid on without much teasing or working about; care being taken that no part of the space to be covered is missed, because any attempt to re-touch, after the color is dry, will show itself. The color mixed in this way will dry dead, or flat, and should be varnished. Of course, if Indian Red be mixed with boiled linseed oil, it will be longer drying, and when dry will appear glossy; so that it will not require varnishing. It may be observed that varnish stands out better—that is, appears brighter on a dead or flat color than upon a bright or golssy one. This applies not only to Indian Red, but to all colors.

PURPLE BROWN is another red color, deeper in tone and not quite so pure as Indian Red; but it is very useful as a ground color, and also in shading. It should be mixed in the same manner as the preceding. It may easily be imitated by a mixture of vermilion and lamp black; but, of course, this is not at all a commendable operation; the Purple Brown being much cheaper than a mixture of vermilion and black. It can be bought at a cheap rate ground in oil.

RED LEAD is admittedly the most perfect iron primer. Its remarkable adhesion to smooth surfaces, to which other paints cannot find attachment, affords permanent foundation for subsequent work. The following coats can be anything; but, to insure best results, ought to be Red lead, too. Red Lead's recognized excellence for priming should not preclude its

use for latter applications. Second coat work is best when homogeneous, that the different coats may be acted upon the same, expanding and contracting with each other.

Eventually the Red Lead may fade by a gradual transformation of the oxide into carbonate. This does not impair its durability however. It is only a surface change and slight scraping will show the Red Lead underneath of the same color as when applied. The introduction of a quantity of dry lamp black, (not to exceed an ounce to a pound of lead,) will give a more permanent, darker shade, while retaining the physical advantages of Red lead alone.

It is an oil cement, with the convenience of a paint. Like other cements, it should be applied within a reasonable length of time after combination with the vehicle; that the hardening, or "initial set," shall take place on the surface of the iron to be protected and not in the pot.

The above results are best obtained by the use of raw linseed oil alone, with red lead. However, minute quantities of japan, or varnish, may be added; or boiled oil used, instead of raw; depending on the requirements of the work—to make the vehicle more vicious, better sustaining the heavy particles of Red Lead.

There can be no dogmatic formula for the mixture of Red Lead. Temperature, moisture, character of the surface, skill and the experience of the painter all being factors. However, by substantial agreement, all the way from eighteen to twentyfive pounds of dry Red Lead to one gallon of vehicle, will make a good

mixture.

FRENCH ULTRAMARINE.—The most serviceable blue for the painter is French Ultramarine, which is a cheap and good substitute for the genuine article. It is permanent, kindly working, and affords a variety of clear tints when mixed with white. It is a brilliant blue, and preserves its purity when reduced in tone by the addition of white. It may be deepened by adding Prussian Blue, or Indigo, for shading; or by a triffling addition of black.

PRUSSIAN BLUE is another serviceable color, but not so brilliant as the preceding. It is useful for blue grounds; but, owing to its extreme depth, it requires the addition of white to bring out the color. Used in its pure state, it has the appearance of a fine, lustrous black; and a common black looks gray in contact with it. Prussian blue is a good working color, and a quick drier. It should be mixed sparingly with other colors, as its intensity renders it dangerous and overpowering in its effects.

The other blues are: INTENSE BLUE, which is very similar to FRENCH ULTRAMARINE; ANTWERP BLUE; Indigo, something like PRUSSIAN BLUE, but not quite so light.

CHROME YELLOW.—There are several kinds of chrome, but those most generally used are known as pale, medium and deep; the former being almost a straw color, and the latter approaching a deep orange. They are seldom required in a pure form, most always being used in connection with some other pigment.

YELLOW OCHRE is a servicable color for thickness,

but is not so brilliant as the foregoing. It is cheap and very useful as a coloring matter.

RAW SIENNA is a brownish yellow, and is a clear, friendly working pigment. It is quite permanent.

BURNT SIENNA.—This is an invaluable color; being a rich, transparent, reddish brown; eminently adapted for shading and glazing over gold leaf; and very strong in color.

VANDYKE BROWN.—A rich, deep, transparent brown; is useful for glazing, and especially for markings on gold.

EMERALD GREEN is the most vivid of the greens, and is a valuable color for painters. It is light in tone and can not be imitated by any mixture of yellow and blue.

CHAPTER XIX.

Summary of Some of the Pigments Most Commonly in Use.

LAMP BLACK—smoke from coal tar.

DROP BLACK—charred bone.

THE UMBERS are an earth found in Turkey and the island of Cyprus.

THE SIENNAS are an earth found in the neighborhood of Sienna, Italy.

CHROME GREEN is made from the blue oxide of chromium; but that mostly in use is a compound of potash, sulphur and chromic acid.

PRUSSIAN BLUE is properly a ferrocyanate of iron.

VENITIAN RED is an earth, found in various parts of the world.

RED LEAD, or oxide of lead.

WHITE LEAD, or carbonate of lead, prepared by submitting common lead to the action of acetic acid.

VERMILION, composed of sulphur and quick silver.

CHROME YELLOW, made from chromium and acetate, or the nitrate of lead.

YELLOW OCHRE is an earth. The best comes

from France.

NAPLES YELLOW is an earth, found near Naples.

WHITING is a carbonate of lime.

SILVER WHITE is a lead, prepared by elutriation.

CHAPTER XX.

Hints on Coloring.

The primary colors are yellow, red and blue; the secondary are orange, green and purple; and the tertiary are citron, russet and olive.

Orange is composed of yellow and red; green of yellow and blue; and purple of blue and red. Citron is a compound of orange and green; russet of purple and orange; and olive of purple and green.

These colors vary in "tint," "shade" and "hue"—terms which are often used indiscriminately by persons who are professionally engaged in painting in some form or other. But these terms are perfectly distinct, and express different meanings which it is proper should be clearly understood.

Every compound of the three primary colors is a HUE. For instance, green, being composed of yellow and blue, may vary in hue from the yellowest to the bluest; a purple, which is a compound of blue and red, may vary in hue as one or the other of these colors predominate; and an orange, a mixture of yellow and ed, may vary from the yellowest to the reddest. A multiplicity of hues may thus be formed of two primaries; but a still greater number may be made by a combination of the three primaries which form the

tertiaries by subordinating or giving predominance to either of them. A color may be changed in hue without any change taking place in its name. Thus, when we speak of green, it may be any hue between blue or yellow; or purple, whether it inclines to red or blue, it is still called purple. Similarly with regard to the tertiaries, the name of the color is the same whichever of the primaries predominates.

If, now, we take either of the primaries, secondries, or tertiaries, and reduce them in tone with an admixture of white, we at once change the names of the colors, and get a tint. A red, for instance, may, by the introduction of white, be made to vary in tint from its most intense state, through every gradation up to white; changing its name to carnation, pink, salmon, and so forth, according as the red or white predominates. This applies not only to the primaries, but to the different hues, which, equally with the intense color, are capable of every state of dilution up to white. It is evident, therefore, that the variety of tint is immensely greater than that of hue.

If we take color or hue in its intense state, and introduce black, instead of a tint, we get a SHADE; for by shade is meant every gradation of a color, or hue, from its original purity down to black. The shades, like the tints, have distinct names; thus, if black be added to red, the result will be what is called a "chocolate."

It is important to bear in mind that there can be no perfectly harmonious arrangement of colors from which either of the primary colors is absent; just as in

form, either structural or decorative, there can be no perfect composition or harmony unless there is a proper tendency of straight, inclined and curved lines. There should, in every arrangement, be one leading color, to which the others should play only a subordinate part. If bright and vivid colors are used with discrimination, they add richness and grandeur; but, if they are applied without reference to place or quantity, they are apt to become gaudy and offensive. Harmony consists, therefore, in a proper balancing of the different parts, by keeping some colors in due subordination, and giving prominence to others. In stating that the three primaries should be present, it is not intended to imply that they should all appear in full strength; because they may be diluted with white, and be used only as tints; or they may be combined with black, and be used merely as shades. In either case, they serve to balance the arrangement, and can not be omitted without detracting from the beauty of the work.

It is a prevalent error among the uninitiated to consider that the arrangement of color is a matter of fancy. Many painters of superlative order say the color theme is of little importance, and that the attention should be centered upon drawing. This, however, is correct in the sense of construction only. But, suppose you have become very proficient in the reproducing of the model, and the color theme has had no study. How very ridiculous, in the eyes of the connoisseur, will the work appear, if the colors are unbalanced, void of harmony, and the warm and cool colors misplaced. The study of drawing and color should be

considered alike, the importance of one being no greater than the other. Most persons know that there are three primary colors; and they think that these may be used in all sorts of capricious combinations; but it has been proven by the greatest scientific authorities that the phenomena of colors are regulated and governed by irrefragable laws of harmony in their combinations; and they can no more be used upon any principle of haphazard than can the notes in a melody, or other musical composition. What would be thought of a composer who should imagine that, by selecting a number of musical notes at random, and arranging them consecutively, he would succeed in producing a piece of music that would delight the ear? And yet this is precisely what many people do in regard to color. They place them in all sorts of whimsical juxtaposition, and when they have a sort of badly arranged patch work, flatter themselves that they have a refined taste and a good eye for color.

CHAPTER XXI.

Gold Leaf and Gilding.

The painter may procure the Gold Leaf at a color store, or an artists' supply house, in books containing twenty-five leaves of gold; each leaf of gold being carefully placed between the papers constituting the book, which is first rubbed over with red bole to prevent the gold from adhering.

The size of the leaves is about 3⅜ inches square. Cut out the first sheet of paper constituting the book. A little raw linseed oil rubbed over this sheet will make it transparent. The paper should be placed on a smooth board, and, with a dry, soft rag, wipe off all excrescences of oil, on both sides of the paper. The paper, which has been thus prepared, will possess a certain "tackiness," or sticky quality, scarcely perceptible to the touch; but sufficient to cause the gold leaf to adhere to it. After some of the sheets of gold have been used, you can cut out more of the leaves of the book and prepare them in the same way; thus giving more paper to work with. This having been done, the gold leaf book may be carefully opened, and the oiled sheet of paper gently pressed upon the gold with the hand. On removing the paper, the gold will be found attached to it. Each sheet of gold should be taken out

of the book in the same way. The gold leaf, being thus secured upon the oiled paper, is ready for use.

The oil should be wiped thoroughly from the paper; if not, the gold will adhere to it too tightly when you are ready to do the leafing. It may be evident that the difficulty experienced through the extraordinary thinness of the gold, is, by this means, to a great extent, overcome. The paper, with the gold attached, can be handled by any person, however inexperienced, and may be used over and over again.

Let it be supposed that the work to be gilded has been coated in with the most suitable material, and that it is ready to receive the gold leaf. All that the gilder has to do is to take up the oiled paper with the left hand, and place it with the gilded side to the sizing; and, having rubbed the back lightly with the right hand, the gold will come off of the paper and adhere firmly to the mordant with which the work has been coated. Besides the simplicity of this method of gilding, another great advantage it possesses is the small amount of waste that takes place. The oil paper being semi-transparent, the gold leaf shows through it, and the operator can see where any portion of the gold adheres to the paper; and can accordingly place it on portions of the work as it will best fit, without any undue number of joinings; though by this process, if the gold leaf be good, not the slightest trace of any joinings is discernible. It will readily be understood that every particle of gold can be made use of.

In addition to these advantages, this method of gilding possesses other recommendations which are de-

serving of mention. In the first place, the labor of affixing the gold to the oiled paper, and subsequently to the lettering, decorations, and so forth, can be performed by an apprentice; or any one who would utterly fail if called upon to use it in other ways commonly in use by gilders, which have not, herein, been made mention of. Then, again, gilding from the tip, or cushion; or from the book, without cutting, can not be effected out-of-doors if there happens to be any force of wind. The ordinary draught, or current of air, which frequently passes through the street, is a serious hindrance to the operation of gilding from the tip, or cushion.

In the foregoing method, the gold leaf should be gently daubed over with a pad, or cotton wool, which will smooth the surface of the gilt, and remove all superfluous pieces of gold.

There is one thing preliminary to the process of laying on the gold which has not yet been noticed. A newly-painted surface is, of course, sticky; which is technically called "tackey;" and if the gold leaf were to be applied to such a surface, it would adhere, or "hang," as it is called. to parts of the ground color where the mordant had not touched, and where the gold was not required. It is necessary, therefore, before the work is even marked out, that the newly painted surface should be "pounced"—that is, daubed over lightly with dry whiting. Care should be taken that the loose particles are dusted off by the gentle application of a silk handkerchief. If the ground color, upon which the gold leaf is to be laid, be a dark one, this pouncing (which is best done by placing the

whiting in a bag and making a kind of pad, or ball, which should be daubed over the work,) will so far lighten it, that the gilder will be able to distinguish any line he may make with the sable pencil charged with the size, as the size will restore the ground to its original color. But, if the ground be a light one, the pencil will not have this effect; and hence it becomes necessary to mix some kind of color with the size, to enable the operator to make certain that he has thoroughly covered the portion to be gilded. The whiting is removed from the ground after the gold leaf is applied, and has become somewhat hard, by washing over the work with a very soft sponge, and then drying the surface by wiping very lightly over it with a damp chamois skin.

The mordants used for gilding are of different kinds. Out-of-door gilding, and gilding requiring great durability, is sized with a size made of fat oil, in which yellow ochre has been ground. This is, under certain circumstances, a good material for the purpose of signwriters; but it is too thick for general adoption; especially in cold weather, when it is unmanageable with the sable pencil. In hot weather it is not so thick, and may be used with advantage. The gold leaf must not be applied to this mordant for at least twenty-four hours after application; and it will remain tackey for two or three days. It is, perhaps, the most durable of any of the sizes used for gilding. When the work is to be finished more rapidly, japaners' gold size, or even rubbing varnish, is generally employed. The gold leaf may be laid on this sizing in about half an hour after

it has been applied, as it dries very rapidly. Linseed oil should not be mixed with gold size to retard its drying properties, because it is apt, not only to destroy the adhesiveness of the size, but to "sweat" through and ultimately discolor the metalic leaf. Do not varnish over the gold, such as sign writing or gold leaf in general; as it spoils the metalic effect.

If any parts have not been touched by the size, when the gold leaf is applied, these omissions will be very perceptible; and any attempt to patch them afterwards will be a failure; as it will not be possible to prevent them from showing.

CHAPTER XXII.

Gilding, Bronzing and Burnishing. Instructions for Amateurs.

The kind of size to be used for bronzing, gilding and burnishing, where brilliancy is wanted, is called burnishing gold size. It can be used for all purposes, only it dries quickly. It can be purchased at paint stores, (in paste). To prepare this size for application, put a very little into a cup and then gently stir in water till it is the consistency of cream. Then slowly add thin white glue. The glue at first will thicken the size, but by still adding the glue it will again become the consistency of cream; and then it is ready for use. Now, with a camels' hair brush, go over the work two or three coats, letting each coat dry; and do not put on too thick, but have the work thoroughly covered before you apply the bronze powder. To apply the bronze powder, first mix a very small portion of dissolved white glue in half a tea cup of water; then just dampen a camels' hair brush, or even the point of your finger; be sure not to have it wet or it will wash or rub off the sizing instead of bronzing it. Now dip this moistened brush, or finger, in to the bronze powder and rub it over the work, and the article is bronzed

to gold or silver, or to any other color according to the color of the bronze powder used. This is called a dead bronze. If gold bronze is used, and you wish to burnish it, rub the burnisher over it, and it burnishes at once. (Burnishers can be bought at paint stores).

I do not give these as instructions to those who know, but to show that either man or women can, with little expense, and very little practice, bronze up old frames, statuary, or any plaster figure, and do it for the home, or for sale.

Bronzing by means of mixed bronze, is to take coach japan, and put a small quantity of it in a cup. Add to the japan gold bronze until it is of the consistency of cream; then give the work a coat of it, using a small camels' hair brush to put it on with. Mix a small quantity at a time; because, if the mixture should stand for a while before using, it will not be quite so bright. This is the most useful method for all work not requiring great brightness.

This method of bronzing may be used in bronzing radiators, wrought iron work, and many different articles. Best results will be obtained by applying the above mixture to the article while moderately heated, if circumstances will permit.

CHAPTER XXIII.

Linseed Oil.

Linseed oil is the seed of the flax plant, from which linen is made. It grows in all parts of Europe, in the Western States of America, India and New Zeland. The flax plant intended for linen is pulled before the seed ripens. The flax intended for oil is allowed to fully ripen before being cut. All the weeds that grow with it are cut with it. The seed of these weeds gets mixed up with the genuine flaxseed and is supposed to be one of the causes of impure and bad oil.

Linseed oil, when it is poor, thin and weak in quality, is but one half its former self, and bad; but when it is adulterated with fish oil, cotton seed oil, or petroleum, (known in the trade as neutral oil), it is a pickpocket that will rob both you and your customer. There has been a great deal of time given to experimenting and testing on the frauds of pigments. Barytes and pulp lead have come in for a fair share of attention. The strength and value of the pigments have been carefully compared, and with profit to the trade. Let us here pause and ask ourselves the question: What part of the paint is the pigment, and what part is the oil? A writer has truly said that linseed oil

has nine-tenths of the virtue of the varnish; and I am inclined to think it is nine-tenths, or even more. I have no hesitation in saying that I attribute the greater part of the trouble with bad paint, to bad, adulterated linseed oil and turpentine. Much of the turpentine used, is adulterated with about twenty percent of kerosene oil.

I would attribute the quick decay of paint to the deficient quality of the linseed oil; whereas the oil, years ago, was cold pressed, the present oil is steam pressed. By the old process they got from a gallon and a quarter to a gallon and a half, to a bushel of seed; now, with the use of hydraulic presses and steam, they get a yield of two and a half and even three gallons. This they brand with impunity "Pure linseed oil." While it is true the oil is pure, yet the quality is far below that from the old, cold pressed production.

We are told that in drying, linseed oil gives off some elements, and takes on others. Notably, it gives off water, and takes on oxygen. This is what produces the leather like substance when it is dry. Water acts readily on linseed oil; it opens up the surface, as it were, and fits it to amalgamate with the next coat.

To test the quality of linseed oil.—Morell detects the adulteration in the following method: "Take ten parts by weight, of the suspected oil, mix it in a small cylindrical glass tube with three parts of crude nitric acid, agitate the mixture well, and allow it to rest. If adulteration is present the oily layer at top assumes a dark brown to blackish brown color, while the acid at bottom varies from bright orange to

orange or dark yellow. So little as three percent of adulteration may thus be detected. If the flax seed oil is pure it becomes during the agitation, first sea green, and afterwards dirty greenish yellow, the acid being bright yellow."

RECIPE FOR MAKING WHITE SHELLAC:—Dissolve eight pounds of shellac in one gallon of alcohol.

CHAPTER XXIV.

The Sinking in of Painted, or Varnished Surfaces.

There is no difficulty confronting the painter, perhaps, that puts him more on the defensive than the title of this article. It is quite probable that the painter is now and then to blame for this trouble; and yet, when the facts of the matter are laid bare, there is no good reason found why he should be held responsible in every instance, almost, for this evil. The cases wherein he may be held accountable, constitute but a small percent as compared with those in which he is not.

The prime causes of SINKING IN OF PAINTED OR VARNISHED SURFACES; or, as it is some times termed, GRAINING OUT; or, still another, THE GRAIN OF THE WOOD SHOWING, and for which the painter may be held responsible, I will mention first, in order that he may later on be held above suspicion.

One of the causes he will most likely have to answer for is painting over imperfectly dried lead coats. Sometimes the priming is not allowed to dry thoroughly. Soft, imperfectly dried priming, or lead coats, will cause very bad sinking in of the varnish. A

roughstuff surface, colored over before the moisture has had opportunity to dry out of the pores, will be sure to cause graining out, or sinking in. In fact, this will develop about the worst form of the trouble in question. In many cases, for lack of time, the color is laid on too soon after the roughstuff has been rubbed. At least fifteen hours should elapse between the rubbing and coloring. If a roughstuff containing considerable lead has been used, the coloring may be done sooner than when a quick, porous filler is employed. The lead is much firmer, more compact in body, therefore takes in and retains less moisture.

To show that the painter is not the meanest of craftsmen, we will endeavor to point out some of the causes for which he is not to be held responsible.

Hard, firm and perfectly dried coats are the only means the painter has at his disposal, granting, of course, that a sufficient amount of paint and varnish are used, by which to hold the finish and luster in position. The lack of a proper amount of paint and varnish will not always account for the sinking in or graining out of the surface. We will now pass on and try to throw some light on the other side of the subject.

Unseasoned timber, with a transitory surface swelling and shrinking, will cause the surface of the wood to show in different forms and conditions at different times. Timber, during the drying process, is very shifting; a new surface being exposed repeatedly before reaching the final dry stage. If an unseasoned piece of lumber should find its way into the panel of a

car, or carriage, it is obvious where the paint or varnish will go, and how the grain of the wood will affect the surface. It matters not how many coats of paint are applied, one or a half dozen, the graining out will show itself in some form not altogether pleasing.

There are cases where the grain of the wood becomes unduly prominent when perfectly dry timber is used. A panel that is canvassed on the inside of a carriage, phæton, or the like, is quite likely to cause trouble, as the glue water from the canvass is sure to pass through the wood, causing it to swell and shrink. If the painting is done, as it often must be, before this opposite action is completed, the paint and varnish must take on a new form to suit the changing surface of the wood; thus causing a greater or less transformation in the painted surface. If you will examine a freshly canvassed panel and see the evolutions take place, you will readily see why such panels and other work should not be primed, or painted, until thoroughly dried. Adjust your microscope, or even the naked eye, and see the wood heave up to let the moisture pass out. You see this gives one condition of the surface; and in sinking back, during the process of drying, we see still another position of the surface. Simply stated this is just what takes place.

In order to successfully prevent a transformation in the surface of a finished piece of work, we must have a non-changing surface upon which to place the paint and varnish. Each coat of paint must be dry before applying a subsequent coat, thus retaining a fixed foundation for each coat. In

the building up of a painted surface, the workman should bear in mind that the combined coatings should possess some elasticity, and not the dry, brittle finish too frequently resorted to. Each coat of paint should be mixed with the view of securing an even drying through the entire process, thereby avoiding the superimposing of a quick drying coat upon one which is not thoroughly dry.

Lumber should not be stored in ill-ventilated and ill-lighted rooms, nor placed under the direct rays of the sun, which will give a dead visage to the grain of the wood.

The person in charge of property many times paves the way for graining out or sinking in of painted or varnished surfaces, such as the washing of freshly painted carriages; and, as the writer has many times observed, in the washing of interior varnished or painted work, with a hydrant hose, turned on full force, using all the water at his command, with a torrent inside and out.

The keeping of a carriage around a horse barn, where amonia is present in large quantities, is another cause of destroying the surface of the varnish, and should be avoided, if possible.

You see there are any number of causes for the SINKING IN and GRAINING OUT of painted surfaces, for which the painter can not be responsible, and should receive no condemnation.

CHAPTER XXV.

Miscellaneous Remarks.

OLD WORK.—To remove smoke, dirt and grease, wash over the parts with soda water before painting.

BRUSHES—That have become dry and hard, may be softened by placing them in hot turpentine. Be careful not to let it get too hot, nor allow the flame to come in contact with the turpentine.

CARE OF SHELLAC BRUSH.—To wash and keep a shellac brush for future use, just wash it clean when through using it with "Gold dust" washing power. Wipe dry and straighten the bristles out straight, and lay it away.

JAPAN RELATIVE TO OIL COLORS.—Never try to mix oil with colors ground in japan, without first diluting them well with turpentine; because, if the oil is applied first it will curdle the color and make it utterly unfit for use.

TO MAKE A DULL VARNISH.—For cheap and quick varnished work, requiring a dull finish without the expense of rubbing the gloss off, melt a small piece of bees-wax in the varnish, which will produce a dull gloss, looking like a rubbed surface.

TO KEEP PAINT FROM CREEPING.—Rub turpentine on the work before painting; or, by rubbing soda over the parts; or, by adding a very small quantity of lye to the paint. Be careful, too much will ruin the paint. First dilute it in a little water.

DILUTING COLORS WITH TURPENTINE.—Always dilute colors ground in japan with turpentine before attempting to mix them with pigments ground in oil. If you fail to do so, the pigment ground in japan will curdle at once when compounded with the oil color.

COLORS GROUND IN JAPAN. CAUTION.—Do not pour linseed oil over colors ground in japan to keep them from getting hard; for the color will harden soon after the oil has been placed over the pigment. Always cover the pigment ground in japan with turpentine.

TO BRONZE HIGH LIGHTS ON INTERIOR METAL WORK.—Take black varnish and add sufficient pigment to make the desired bronze hue. Paint the ar-

ticles, and when nearly dry, bronze the high lights, using the best bronze, applied with a small piece of chamois skin; finish with a coat of coach varnish.

CLEANING CUPS AND BUCKETS.—Put one or two boxes of concentrated lye into five gallons of water; and into this lye drop the cups or buckets; allowing them to remain therein from five to eight hours, or longer, according to condition. Take them from this when the paint is eaten off, and clean in clear water.

VARNISHING A GLOSSY SURFACE.—To varnish over a surface without first removing the gloss, just sprinkle a little water over the surface as you varnish it. The varnish will turn white, looking like soap; but it will return to its natural state. This method should only be employed when finishing cheap work.

OIL PUTTY should be made with raw linseed oil; or, if you add more oil to the putty, for the purpose of softening, it should be raw oil; for the reason that it will dry through and through alike. If boiled oil is used it will dry faster on the surface than inside; thereby causing the surface to wrinkle, which is so commonly seen.

TO REMOVE PAINT FROM WOOD WITHOUT BURNING IT OFF.—Give the surface a heavy coat of strong

soft soap, allowing it to remain on the paint from twenty four to thirty hours; or until the paint becomes soft when it may be scraped off and the surface washed free of the soap. Let the work dry thoroughly, then sandpaper it, making the surface level and smooth.

SETTING OF GLASS.—Large and medium sized glass should be laid in soft putty, (called bedding,) with the crown or convex side out. Sink the glass in the putty with a steady pressure, until it has an entire putty bearing; then, with a chisel, of good weight, drive the glazing points in the sash. Do not place any points at the center of the glass, as it will be quite sure to crack the glass in time.

TO REMOVE PAINT from woolen garments that have been brushed against a newly painted surface, when gasoline is not accessible; just rub the soiled spot with some of the same garment which will remove the paint nicely if only a surface soil; but if the paint is well rubbed into the fiber of the goods, it will require the application of gasoline to remove it, which should be done before the paint becomes dry.

THE TAKING CARE OF BRUSHES.—Brushes which are but seldom used, and those used for shellacing, should be washed out thoroughly when done with them, Gold Dust soap being the thing I know of for this purpose. The brushes which are in every day use; and

those not used quite so often, may be kept in water. They should have a hole bored through the handle in a place where it will not weaken it, and cause it to break, and placed on a peg, or wire, just high enough to keep the ends of the bristles off of the bottom of the brush box.

TO KEEP NATURAL WOOD FINISH IN GOOD CONDITION,—and to remove scratches and mars. With a soft rag, saturated with raw linseed oil, rub over the surface of the varnish, leaving just enough oil on the surface to remove all scratches and mars. Then with a clean, soft rag, wipe the surface dry, being very particular to remove all the oil; because, if any oil should remain after through, dust would settle on it, and after the oil was dry, the dust could not be removed, thus making the surface of the varnish look rough and sandy. This will restore and make old, scratched varnish look much like new. Beads and corners should be wiped out well, using a rag over the end of a sharpened stick for the purpose.

NEW BRUSHES,—When first put into service, should not be kept in water for a few days, for the reason that they become soft, flabby and non-elastic. When through with the brush for the day, it should be pasted out on a board, with the bristles straight and close together. This should be practiced each evening when through work; until the brush is well broken in; after which it may be placed in the brush

box along with other brushes. A brush may remain pasted out in this way a day or two with out injury to it; however, judgment must be exercised as to the length of time the brush should be so pasted out. If the brush should become too dry, it would render it unfit for use, and consume some time to get it in shape again. These instructions apply to bristle brushes for exterior house painting only.

THE USE OF VARNISH.—Sometimes we have heard it said that "caution tends to meanness." Such a phrase can hardly be applied to the exercise of caution in the treatment of varnish. We very frequently meet with a painter who finds it convenient to thin the varnish for the purpose of making it work easier, and, in many instances to make it cover more surface. This practice is as harmful as the mixing of varnish. There is, perhaps, occasionally an emergency where it calls for the thinning of the varnish. However, such cases are rare, and if the stock of varnish has properly been stored, and not allowed to become thick in the can after being opened, by carelessly neglecting to re-place the stopper, thinning will be altogether unnecessary.

On work painted with light and delicate colors, the varnish is often thinned with a view of preventing its staining the surface. Such work and natural woods of very light color, should be varnished with some light colored varnish instead of thinning a heavy bodied and clouded varnish for this purpose. One of the cardinal virtues of a varnish is a

rich and high luster. The maker of good varnishes furnishes it ready for use, combining free and easy working qualities, durability and brilliancy; therefore, when turpentine is added by the workman, the luster and durability of the varnish is impaired.

TO MAKE ENAMEL PAINT FOR HOUSEHOLD USE, ETC.—For interior work, use rubbing, or interior varnish. For exterior purposes use No. 1, coach varnish. The pigment or coloring for the enamel should first be thinned to a semi-state of consistency with turpentine. Now add to it varnish in quantity enough to make it the proper consistency for use. It should be sufficiently thin to flow freely from the brush. If, after the enamel is prepared in this way, it should be too thick, and of little covering power, add a little turpentine. The turpentine will have a tendency to kill the gloss of the varnish, if too much is used. If the enamel is dense in color, that is, covers the surface well, you may add more varnish instead of turpentine. For white enamel use white lead for the pigment, but if durability and whiteness are required, use zinc white. The latter will make a splendid enamel for inside of bath tubs and similar articles, if made a little thin and from four to five coats are applied. You may use white lead for all ordinary work, as it is more dense; and one or two coats will be sufficient. For dull red, use Indian red; for bright red, use English vermilion; for brown, use Indian red and black in proportions to the shade desired; for black, use lamp black or drop black, the

latter being much the blackest. This will make a very good enamel paint, if combined with No. 1 coach varnish, for painting old buggies where one coat is all that you wish to give them. Any tint of enamel may be made by adding white to the color; or any shade by adding black. The above enamel makes good paint for painting chairs, etc. Always remember to use the interior varnish for inside work, and the coach varnish for outside work. Use a chiseled bristle brush, of the proper size to suit the work to be coated. The colors used in making the enamel should be procured ground in japan.

CHAPTER XXVI.

Conclusion.

In terminating this work, I wish to impress upon the mind of the reader that the degree of success attained in any of the branches of painting herein treated, depends upon the constant application of the student, both in study and practice.

In the belief that painting should be studied as a science, as well as practiced as an art, the preceding pages have been presented to the public.

That painting is a science, that there are certain established principles observed by all good painters, and violated by all bad ones, none will deny who have carefully taken up the subject. To understand and practically apply these principles should be the prominent object of the student.

The design of this work has been to unfold the principles of painting in its many branches; to show their application to the different forms and kinds of work; to classify them under their appropriate styles; and, in connection therewith, to furnish sufficient information for cultivation, which may be the means of uplifting the now depraved condition of the art of painting.

Without this aim all cultivation will be of little

avail. There are instances of students of painting who have carefully and diligently applied themselves, in study and practice, who have risen high in their profession, and derived therefrom all the advantages they proposed.

A radical defect exists somewhere along the line of painting, either with the workman, or with the material he is too often forced to use; or, in many cases, a combination of the two. Let us unite our energies and forces to the ultimate uplifting of our profession and the complete routing of cheap and adulterated material. As intellect and honesty in the art of painting advance, so will the use of low grade material retrograde and vanish. An experience of nearly twenty-six years as a practical painter, in its different branches, has convinced the author that the study of painting usually ceases where it really should begin, namely: with the adoption of just as few principles as can possibly be acquired, then affixing to their names the too often disgraced words, painter, artist, decorator and contractor.

When the art of painting shall be studied in all its phases, and as a science, its principles known and put in practice, then, and not till then, will good painting be the rule, and not, as now, the rare exception.

Let your aim mount the wings of fame and soar to towering heights in the channel of your occupation, qualifying yourself that you may be worthy of the name you wish to bear. Though you may fall short of the mark you have aimed for, the world, in the art of painting, will be the better for your having existed.

Many are they who crowd at the bottom, but there is plenty of room, and few at the top. Those having acquired proficiency in the different branches of painting, find themselves in demand and liberally remunerated in return.

There are those persons, who, to some extent, inherit qualities which better adapt them for the occupation of painting than other persons less fortunate. There are elements in the art of painting, drawing, designing and decorating not like those of other occupations, and may be characterized in two ways, namely: mechanical and natural ability. Mechanical ability is that part of the work which may be imparted from one person to another, while the natural ability is that intuitive sense which enables one to immediately, without the intervention of argument, or assistance, to perform certain parts of the art.

Let us educate the people at large to know the difference in the quality and appearance of good and bad work, that they may the better judge for themselves the superior ability of one craftsman over another. I hope the brother knight of the brush who is naturally qualified, and he who must acquire it all by the dint of hard study, will co-operate together in lifting aloft the art of painting to such a high standard of excellence, that the would-be painter who has been dabbling in noxious mixtures, and most discreditably applied, will find opportunity to no longer perpetrate his practices, which are not only damaging to the people in general who have liberally patronized him in the past, as well as in the present; and that the damnif-

ic influences which have had so much bearing upon the earnings of the skilled artificer, may, by your united energies, be forced to quit the ranks of those to whom the spoils belong.

The rules and methods given in this work are based upon the good results obtained by the application of the same; and buildings painted during a certain period, the work having been performed and superintended by the writer, gave an average percent of seven and one-half years; while I obtained a maximum of seventeen years by the use of my own mixtures from white lead, zinc and linseed oil, the surface still remaining intact and free from chalking. Some of these buildings were re-painted for appearance sake, and others for the protection afforded.

I only make mention of these facts to show that if pure, firstclass material had been used throughout the whole list the average percent would have been greater. If pure material is used, properly mixed and applied, equally as good results may be obtained.

Realizing the need of a work wherein simple and correct methods might be laid down, and the great difficulty in obtaining good results from the use of much of the defective material with which the market is flooded; and the inability of the average workman to prepare a paint which will prove satisfactory to himself, as well as to his employer. I have felt it my duty to give publicity to the information herein contained, and trust that the application of the same will be the means of establishing friendly relations between the knight of the brush, to whom they may

come, and the author.

Exterior house painting is, perhaps, the most common branch of painting; not defined so from a point of workmanship, but that which the painter is called upon the most frequently to perform. Yet, as common as it may appear from any point of view, there is more room for improvement and expressive work than the student may imagine.

The uniting of colors in a harmonious arrangement within themselves, as well as with surrounding objects, is a feature in the beautifying of homes that can not be treated in a light and careless way. If you were asked to arrange upon a card several different colors of friendly relations, you would choose those of a harmonious character, at the same time combining that degree of contrast which would lend prominence, and yet mantain that pleasing and agreeable effect so characteristic in nature. This is the exact thing you should do in the treatment of a line of houses along a street. Each house should have its distinct color, but should be a harmonious factor in connection with the entire line of colored buildings, not omitting a consideration of the immediate surroundings.

Suppose the artist was to paint a beautiful landscape, and in the center thereof would paint a bright red barn, or a spotless white house. What would be the criticism for such an offense? There could be no difference in such a practice than the painting of such buildings in reality.

How offending to the eye, when traveling through a beautiful expanse of country, to see nature's har-

monious color effect destroyed by the strong opposing colors from the painters' brush.

Nature paints with the brightest and most vivid colors at her command; yet she so modifies them with a balancing of neutralizing tints and shades that the whole presents the grandest effect—God's handiwork.

Without the balancing of colors, to place the bright and vivid colors in subordination, the entire effect would appear gaudy and displeasing; thereby combining the sublime and the ridiculous.

Autumn's display of color should attract the eye of him who would be a colorist, with its spread of varying tints, shades and hues—high lights of white and Naples yellow, and with bright red scattered here and there, varying in tints in all the degrees to which it is susceptible. Shades ranging from the most delicate to stronger, in great contrast. The whole assemblage of color, intermingled with the now fast receding greens in all its possible variations, comprising a beautiful and grand arrangement, at once pleasing and awestriking to the beholder.

"Diligence is the mother of good luck, and God gives all things to INDUSTRY. Then plow deep while the sluggard sleeps, and you shall have corn to sell and to keep. Work while it is today, for one today is worth two tomorrows."

THE END.

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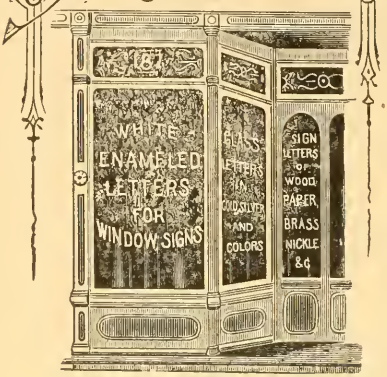

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